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ADDRESS.

THE CHEMICAL RELATIONS OF REMEDIES IN SCIENTIFIC THERAPEUTICS.

Address of the Chairman of the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY JOHN V. SHOEMAKER, M.D., LL.D.
PHILADELPHIA, PA.

The blood is a nutrient fluid tissue, rich in corpuscular elements. The health of the tissues depends upon the health of the blood. In the act of nutrition the cells of each organ select their appropriate pabulum. The cells are the essential and active components of any organ or tissue. In health and disease alike it is the influence of the blood upon the cells that we must study. We witness perverted cell action as the result of disease. The normal composition of the blood is maintained by the statedly renewed supplies of aliment.

As the constituents of normal blood influence the cells according to the type of health, as in disease the activity of the cells is so modified that their functions are very imperfectly performed, so when in disease remedies are given it is still upon the cells that their action is exerted. Thus as regards their mode of production, a close analogy exists between the nutrition of health, the disturbances of disease and the action of remedies.

As food is obtained from the animal and vegetable kingdoms and includes certain necessary mineral constituents so our remedies are taken from the vegetable and mineral worlds together with some from the animal kingdom, which, however, until recent years were comparatively few in number. Within a few years past a variety of preparations have been more or less extensively and successfully employed. It is of these and the principles of their employment that I would say a few words today, believing that the subject of tissue therapy and serum therapy is often misunderstood and misrepresented.

It was undoubtedly a great advance in scientific medicine when the chemists began to isolate the active principles of vegetable drugs. The possession of alkaloids, glucosides, etc., enable us to administer drugs with a precision and efficiency which were formerly impossible. A second and, I am disposed to believe, a greater, advance has begun in the introduction of animal tissues, extracts, serums and antitoxins into medicine. These methods are yet in their infancy; we are not sure concerning every step in our progress; they are, no doubt, subject in many directions to revision, but they are based upon the experimental work of modern science and may be modified according to future experience. When we examine this class of remedies we find that they may be divided into three groups, viz., extracts of glandular and other organs, serums and antitoxins. The serums, again, are taken from animals naturally immune to certain diseases and from those who have been rendered artificially immune. Correspondingly, as regards their application, extracts are used in the diseases of nutrition and the serum and antitoxins in those due to infection.

The doctrine of internal secretion, announced by Brown-Séquard, has been prolific of practical benefit; it has been shown experimentally and clinically that the ductless glands perform a very important office in the economy. They elaborate from and return to the blood a material which is necessary to the maintenance of health. Other glands which possess ducts for the discharge of their secretions, have been shown, nevertheless, to produce also an internal secretion. In the latter class are the testicles and pancreas. The testicles were the first organs to be utilized in the treatment of disease. When we consider the highly vitalized and specialized character of their secretion we need not be surprised that its loss or suppression should be attended with depression of the physical and mental force. Brown-Séquard, therefore, conceived the idea that orchitic extract might be of service in arresting failing nutrition of old age. You are all familiar with the incredulity with which this proposition was received. Some who tested the new remedy, however, supported the claims which had been made on its behalf and believed themselves warranted in extending its application. It has been used with advantage in a number of organic diseases of the nervous system, as locomotor ataxia, chorea and different forms of paralysis. In cardiac debility it has also been of service.

The most brilliant victory was next won by a ductless gland in the treatment of myxedema. The value of thyroid extract in that previously intractable disease has been so conspicuous that negative criticism has been forestalled. Under the influence of thyroid therapy the skin softens, the mucoid infiltration lessens or disappears, perspiration returns, the mind clears, the strength increases, the temperature rises and the features lose their deformity. Thyroid extract has likewise been of value in relieving cretinism. It has been applied to the management of certain other diseases accompanied by depressed nutrition, but although it has accomplished good in some cases it has not been so remarkably successful as in myxedema. It was hoped that we might find in the thyroid gland an efficacious remedy for exophthalmic goiter, but our expectations in that direction have not been realized. The reports have been scarcely favorable to its use in that disease.

The thymus gland has been employed likewise in various disorders of the blood and nervous system, but we are unable to report any decided success from its use. Addison's disease stands in much the same relation to lesions of the suprarenal capsules that

myxedema does to incapacity of the thyroid gland. An extract prepared from the glands has been tentatively used in this disease. Experience is not as yet, perhaps, sufficiently extensive to justify the expression of any categorical opinion. In a number of instances it has been of undoubted efficacy. In some it has increased the strength and relieved the nervous manifestations without exerting any influence upon the pigmentation. In others, it has caused a decrease in the coloration as well as improvement in the subjective symptoms. The truth probably is that suprarenal extract will benefit such cases as are at all susceptible of improvement. When carcinoma or tuberculosis is the cause of suprarenal disease, little can evidently be now expected from any therapeutic measure. Nevertheless, some of the cases of Addison's disease which have been ameliorated by this method have apparently been of tuberculous nature. The prospect for Addison's disease will brighten if the experiments constantly carried on as regards tuberculosis shall be rewarded by distinct success. There are other pathologic alterations to which this disease is sometimes due, and which will probably prove more amenable to the treatment. In conclusion, I would say that in a given case it would certainly be be worth while to make a trial of suprarenal therapy.

Extracts obtained from other than glandular organs have been employed in the thought that a more direct nutritive supply to the cells might be possible by this means than by those ordinarily employed. Extracts of brain and spinal cord have seemed, to competent observers, to have a good effect in neurasthenia, locomotor ataxia, progressive motor dystrophy, senile debility, etc. Preparations of cardiac tissue have been injected for asystole, but the most remarkable temporary improvement was in the case of uremia under the care of M. Dieulafoy, and to which nephrine was given. The case, unfortunately, was too far advanced to be benefited by any mode of treatment, but the temporary results were very striking.

Attempts have been made to influence the course of diabetes, more particularly pancreatic diabetes, by using extract of pancreas in such cases. Although this treatment had little or no effect upon the quantity of urine passed, yet it often had a favorable influence upon the patient's general condition. Pulmonary, ovarian and prostatic juices have been made use of in diseases of the corresponding organs. Bone-marrow has given some very excellent results in pernicious anemia.

It is fair to ask whether suggestion does not play an important part in the improvement under such methods. This may, indeed, be a great factor in the care of functional nervous maladies, but pains were taken, in most instances, to eliminate its influence, and in organic disease suggestion would have less effect.

We seem now to stand upon the brink of a new era in therapeutics. We look to organic chemistry to furnish us with the active principles of tissues and serums, as it has given us the active principles of vegetable drugs. As the active principles of all plants have not yet been isolated, it need be no wonder that in a new field and dealing with complex animal tissues, this problem, for most substances, remains unsolved. A beginning, however, has been made. The efficacy of orchitic extract depends upon the presence of an organic crystalline substance called spermin, which exists in combination with hydrochloric acid. The active principle of the thyroid gland is believed to be the substance isolated under the name of iodothyrin. In the same way the antitoxins, in so far as they have been discovered, may be looked upon as the active principles of the immunizing or curative serums. Schaefer and Oliver have obtained from the medullary portion of the suprarenal bodies an organic principle which has a powerful action upon the heart, voluntary muscles and peripheral arteries.

The serums obtained from animals rendered artificially immune, contain antitoxins, and have proved of more value than those from animals naturally immune to certain maladies. The typic instance of success in this form of therapy is diphtheria antitoxin. The wonderful reduction in the mortality from diphtheria which this preparation has effected can not be gainsaid. Every physician should seriously debate in his own mind whether he has done his duty in a case of diphtheria if he has neglected to take advantage of the immunizing and curative properties of diphtheria antitoxin. As diphtheria is such a wide-spread disease, every reason, humanitarian and sanitarian, as well as scientific, should combine to make us welcome this important advance in the treatment.

Though by no means as common as diphtheria, tetanus is a justly dreaded malady. Its terrible manifestations, and the failure of other methods are in glaring contrast to its improved statistics under an antitoxin treatment.

I shall merely allude to the progress of laboratory and bedside studies with serum therapy in suppurative diseases, leprosy, cholera and the plague. They depend upon similar principles and may require modification as regards many matters of detail, but we may hope that in the end much good will be accomplished by these means. The problem concerning tuberculosis has not yet been solved. Notwithstanding the great and deserved scientific reputation of Professor Koch, his methods have failed to achieve the desired results. Nevertheless, it seems probable that he is working upon correct principles and that success will at length reward his efforts, or if not his own, those of some other observer.

Sanarelli is now complementing his brilliant investigations into the bacteriology of yellow fever by the attempt to treat the disease by means of an immunized serum. Some favorable clinical results have been reported and it is possible that the comming summer may see some experiments on a large scale among American troops on the island of Cuba. It is well known that Surgeon-General Sternberg is personally interested in the subject of the yellow fever bacillus. Professor Chantemesse has recently read a paper upon the soluble typhoid fever toxin and antitoxic serum of typhoid fever. In this important communication the author describes his experiments upon animals, and concludes in these words: "Fortified by these experiments, I injected some antitoxic serum into a patient suffering from typhoid fever. The value of this new method of treatment can only be determined by a statistical study and numerous observations. I may say, however, that the serum acted well in an antitoxic manner, diminishing and suppressing the nervous symptoms, lowering the temperature and promoting the recovery."

A few years ago Drs. G. and F. Klemperer endeavored to obtain an immunized serum capable of curing

pneumonia. Some encouraging clinical trials were made, but the serum did not seem to have sufficient strength to be practically useful. Others have labored in the same direction, and it has recently been announced that Professors de Renzi and Pane, of the University of Naples, have devised a method by which large quantities of a powerful serum can be obtained. A series of cases was observed in which very excellent clinical results were obtained in Professor de Renzi's service, and in the *New York Medical Journal* for May 7, 1898, Dr. Antonio Fanoni of New York describes a case in which he made use of this method with success.

As analogous to the antidotal action of antitoxins and serums, may here be very briefly mentioned the antagonistic action sometimes seen between different diseases. Thus, a fever has been known to cause the disappearance of new growths or glycosuria, and impaired eyesight has been improved by an attack of smallpox.

It seems that at this juncture we must look to physiologic chemistry for assistance in further progress. With the isolation of the active constituents of the various glands and serums which have been thus far experimentally employed, we should be in a position to administer such remedies with greater precision and greater advantage. The chemistry of bacteriologic products has already given us a number of substances of definite composition. It is now highly desirable that all the organic juices, extracts and serums should be analyzed in order that we may be able to estimate the comparative value of their constituents and study their physiologic action. The effect of the animal extracts upon the healthy animal has been the subject of an elaborate series of experiments by Professor Isaac Ott of the Medico-Chirurgical College of Philadelphia. What is next of importance in the study of these extracts is that we should be able to determine the substance or substances upon which their activity depends in precisely the same manner as we have learned that morphin is the active principle of opium, strychnin that of nux vomica, ptyalin of the saliva, pepsin of the gastric juice, pancreatin of the pancreatic secretion, etc. As, however, pancreatin is not the sole digestive ferment of the pancreatic juice, or morphin the sole alkaloid of opium, so, it may be, the complex organic tissues may contain principles having various actions. If these various constituents can be separately prepared and their individual values estimated we may be able to admister them separately or combined, according as they may be indicated. This would constitute a step in advance and would enable us to prescribe the active principles of animal extracts with exactitude, just as we can now, at our discretion, order pilocarpin to represent jaborandi, or caffein to represent caffea, etc. Another important advantage which would result from the chemical analysis of this class of remedies would be in obtaining standing or uniform products. As it is at present, we have a number of animal products obtained by different discoverers and prepared by different processes and having, perhaps, rival claims to our favor. Have we not reached such a point in the evolution of this subject that analogous preparations can in this way be standardized? It is necessary that the exact degree of the virulence of the toxins and antitoxins of therapeutic serums should be accurately known and should be maintained at a certain fixed standard, and this point was urged at the recent Ninth International Congress of Hygiene and Demography by Professor Behring. It appears that it should now be possible to determine a standard type of serum, especially antidiphtheritic serum, according to which the therapeutic results reported by observers in different countries might be fairly comparable. At the congress referred to it was decided that a committee of experts should be appointed to consider whether there would be any advantage in having a uniform international standard of strength in the case of antitoxic serums.

The processes by which all these preparations are made should be the common property of the scientific world, just as we have in the United States Pharmacopeia directions for preparing all the official products. Different specimens of any crude drug of vegetable origin will give quite a notably different percentage of the active constituent. No matter what this variation may be, however, we know that when we make use of an alkaloid or glucoside we are dealing with a substance of definite chemic composition, the same under all circumstances and by whomsoever manufactured. Has not the time now arrived when such a work should be begun in reference to glandular extracts and curative serums? We should then appreciate more exactly upon what basis we stood. Finally, those which have been proved of value, as, e. g., iodothyrin, should be made official and adopted into the United States Pharmacopeia, with full instructions regarding the mode of their preparation. The physiologic and therapeutic effects of these active principles of extracts and serums could then be separately determined. Their utility in medical practice could be more justly estimated and this new branch of applied therapeutics be placed on a more scientific foundation.

This, it seems to me, is the line along which future progress is to be made. The entire evolution of the subject under discussion is so recent, it is based upon conceptions so essentially modern, that we need not be surprised if all its promises have not yet been realized. The good which has been accomplished in diphtheria alone is an ample reward for the labor that has been spent in its development and a justification for the hope which is entertained of the success of this method of therapy in other diseases. It is based upon the most modern doctrines concerning bacterial activity, immunity and mode of cure. A powerful trend has for several years been setting in in this direction, and the present status is the outcome of numerous independent or collateral lines of investigation.

Immunity is better than cure. If an immunized serum is capable of conferring immunity against a certain infection, it will be very readily comprehended that an immense boon has been conferred upon humanity.

If it be found that this immunity against an infection is not permanent, but lasts only for a certain time, it will be an easy matter to repeat the operation at stated intervals upon a fresh exposure, just as we now hold ourselves prepared to repeat the process of vaccination upon the outbreak of smallpox or after the lapse of a certain number of years. This is, indeed, nothing more than we observe in nature, for although an attack of one of the eruptive fevers generally confers immunity for life, this rule is by no means universal. Other species of infection, as is well known, far from bestowing future immunity, predispose to successive attacks.

ORIGINAL ARTICLES.

MODERN TREATMENT OF TUBERCULOSIS.

Presented to the Section of Materia Medica, Pharmacy and Therapeutics at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY CHARLES DENISON, A.M., M.D.
DENVER, COLO.

I am requested by our Chairman to formulate the theories and conclusions on the modern treatment of tuberculosis. The object is to bring out your thoughts and excite discussion, and I trust I shall not fail in this purpose. As there are no two cases of tuberculosis in a thousand alike in all their various phases, so I might almost say there are no two physicians who will treat these manifestations in the same way, even if they are all recognized, which is a question. Our mental appreciation of this most important of the diseases which afflict the human race is in a formative state. I fancy one would only have to announce a set plan of management, which he would carry out as suitable to the great majority of his own patients, and the desired controversy would at once be set in motion in opposition thereto.

Taking 100 per cent. as a basis of what we, as physicians, can do by advice and treatment, and allowing a margin with regard to the great variety in cases, the accompanying table gives the estimate of treatment which I propose for your consideration. You may say it is my own conclusion based upon my personal experience with the disease and twenty-five years' practice in Colorado. You may also assert that experiences all differ and you can not vote as I do. That is just the kind of discussion I am after.

Since it is assumed—in which I trust you all agree with me—that the best make-up of the "modern treatment of tuberculosis" is a composite affair, I may state the divisions or heads, with this admission, namely, that they naturally run into each other, consequently some concession is needed in making any divisions at all. Notwithstanding the difficulty in pinning medical men down to positive conclusions, which peculiarity may have been brought to your notice, I have tried to make these divisions of our topic fair and just for the purpose in hand, namely, to bring out discussion and, if possible, arrive at some definite conclusion as a basis of a successful fight against this terrible scouge.

TUBERCULOSIS TREATMENT TABLE; APPROXIMATE ESTIMATE OF RESULTS.

Proportion of benefits due to	Range of per cent.	Average per cent.		
1. Climate and change, involving mental influence..	15 to 45	30	45	
2. Exercise and out-door life	10 to 20	15		
3. Good feeding, special dieting and attention to alimentary canal	10 to 20	15	30	55
4. Medical supervision and medical treatment	5 to 25	15		
5. Inhaling, local medication and surgical interference	5 to 25	15		
6. Specific medication, based upon antitoxin treatment	0 to 20	10		
Totals; per cent	45 to 155	100		
	100			

I shall devote most of the time allotted to me to the consideration of the last two divisions of this combined treatment. Therefore let me save the repetition of my own arguments in substantiation of so large percentages given to the first three of these means by referring to papers I have written.[1]

It must also be borne in mind that the physicians' services extend all the way through the last four of these remedial means; *i. e.*, have to do especially with a calculated 55 per cent of all that can be done in the way of treatment.

The third and fourth divisions should naturally be grouped under a combined head, giving an average of 30 per cent. of the total benefit. This is perhaps a sufficient concession to this important part of the individualizing process, which it is the duty of the medical adviser to see to in every case.

To the fourth division—medical supervision and medical treatment—to which a proportion of 15 per cent. is given, it may be objected by some that too little credit is given the professional adviser for what can be done. The physician at best is but an aid or guide. Mostly all is due to the energy, faithfulness and perseverance of the patient himself. To be sure, tonic treatment, strychnia, arsenic, hypophosphites, etc., for "toning up," and guaiacol or creosoted preparations for antiseptic effect, chiefly in the upper portion of the alimentary canal, are entitled to recognition and should be granted a limited per cent. of the good we can do. The possibility of so saturating the blood with an antiseptic or germicidal agency, such as creosote, that the tubercle bacilli will be stopped in their sporing or growth, and the patient not be injured thereby, is a mere speculation. The efficiency of this method, which is at the present time very attractive to a large proportion of the profession, has not yet been demonstrated, further than to show an antiseptic effect in the alimentary canal and upon the lining membrane thereof.

The fifth division of our aid—inhaling, local medication and surgical interference—naturally covers a more uncertain field, for not all cases are equally suitable for their employment. When the tuberculosis is centered in the upper air-tract, it has been very generally admitted that through inhaling and local treatment medicaments may be made to reach the affected parts, and a staying of the progress of the local disease be accomplished.

The doubt has been, however, whether inhaled antiseptic or germicidal agencies ever reached the alveoli and bronchial terminals, where the disease is oftenest located and has its strongest intrenchments. This futility of the ordinary and old-fashioned plan of inhaling is a fact. It is true that the more a lung is diseased with tuberculosis and the usually accompanying infiltrating and shrinkage process, the less possible is it that inhaled medicaments can reach the affected parts. The treatment, whether it be pure or ozonized air, or etherealized or atomized germicides, all goes to the flexible, the healthy, lung.

Here again, for lack of time to fully elaborate the argument, I shall have to refer to papers I have written upon this subject.[2]

[1] For the first means—climate and change, involving mental influence—see article on "The Climate of Colorado for Respiratory Diseases," published in the JOURNAL for May 7 and 14, 1898. I believe this argument warrants the 30 per cent. of advantage allotted to this agency of climate.
For the second means—exercise and out-door life—to which 15 per cent. of the total benefit is given, reference is made to the essay on "Exercise for Pulmonary Invalids," read before the Congress of Medico-Climatology of the World's Fair Congress, June 1, 1893.
For the third division—good feeding, etc.—to which an average of 15 per cent. of all good is attributed, reference is made to "Food for Chronic Pulmonary Invalids," read before the Colorado State Medical Society, June 20, 1894.

[2] "Exercise for Pulmonary Invalids," op. cit. "The air-pressure Inhaler and Exhaler," N. Y. Medical Record, Feb. 10, 1894; "New uses of the Inhaler and Exhaler," Dietic and Hygiene Gazette, June, 1897; and espe-

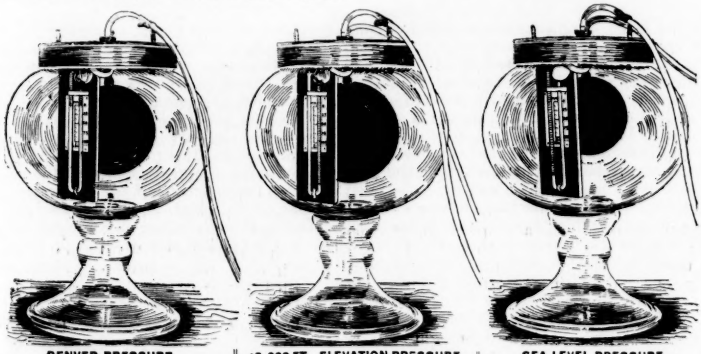
I desire to demonstrate more clearly than has been done heretofore the fact that the correct system of inhaling, or more properly, exhaling; altitude above the sea, and rightly directed gymnastic training, all work upon the same principle, namely: the *mechanical distention* of the air-cells. The reciprocal relation of diseased and healthy lung in the same thorax, and of the air and blood within a given chest with reference to respiration, does not seem to me to have been sufficiently recognized by anybody that I know of; unless it be Dr. T. N. McLean of Elizabeth, N. J., in his late paper "Personal Observations in Pulmonary Phthisis."[3]

This is perhaps a bold statement, but I believe it is fundamental to a proper understanding of the incipiency, the progress and the control of pulmonary consumption. It is quite possible that our inability hitherto to account for the localization of so much of tuberculosis in the lungs, is due to our own fault, because we have failed to recognize the mechanical conditions within the chest which govern respiration and blood circulation.[4]

Now, I blow up the air-cell, and the condition of air-pressure in the globe, but outside the air-cell, is exactly similar to the pressure upon the blood current within our chests, *i. e.*, greater during expiration than during, and in fact, the reverse of, inspiration. To prove it pull out the plug and hear the whistle in the vessel's exit opening. How well this shows that the blood does not flow alone because the heart pumps it, but because the lung mechanism draws it in and forces it out again. How strikingly it shows the preponderance of the expiratory over the inspiratory power of any individual, indicated by the manometer records, proving that it is only during expiration that we have any power at all to distend the air-cells, mechanically closed either by inaction or disease. How important then is the use and control of expiration (not inspiration) to maintain the health of the lungs. You see how it is that gymnastic training and any system of inhaling, to be of use, must depend upon the habitual mechanical distention of the air-cells, and that from the nature of things, can only occur during expiration. The will power given us to prolong and intensify expiration with a fixation of the chest and a lateral expansion of it, due to muscular effort, is our main reliance. It enables us to imitate, yes and to healthfully exaggerate, the natural remedial effect of high altitudes in phthisis.

THE ILLUSTRATING AIR-CELL. (DENISON.)

To show the expanding effect of lessened atmospheric pressure upon the pulmonary organs by toy balloon and manometer inside a sealed glass globe.



DENVER PRESSURE.
5,200 feet elevation, about 12½ lbs. to square inch. Diameter of cell (balloon) $1\frac{1}{16}$ inch.

13,000 FT. ELEVATION PRESSURE.
9 lbs. to square inch, same air in balloon expanded. Diameter of cell about $1\frac{3}{16}$ inch.

SEA LEVEL PRESSURE.
15 lbs. to square inch, same air contracted. Diameter of cell about $1\frac{0}{16}$ inch.

The *illustrating air-cell*, which I here show you, I have devised to suggest more clearly to the mind these intrathoracic mechanical conditions. This three-gallon glass globe is to represent the thorax. It is, as you see, rigid and should be air-tight. The muscular force, to represent living conditions, is transferred to the interior of the globe by an air-pump or by our own breathing power. The record of that force, or air-pressure, is given by a manometer inside the globe. There is an opening in the cover to represent the exit or entrance of the blood-vessels which are in the thorax. This has a valve in it which will whistle when the current is outward. Finally, in the center, connected by a tube with the outside, is this rubber balloon representing a flexible air-cell, which you may imagine, if you will, to be one of your own air-cells magnified a million times, more or less.

A total increase of expiratory power, more than any other agency, can account for the benefit which results to an invalid arriving at the height of 6000 feet in a climate like ours. You can see by this illustrating air-cell how it is that he *has* to breathe a fifth more air than he did at sea level to get the same amount of oxygen here as there.

It only remains for us to draw out about three pounds of the pressure there is in our glass globe, and you will see the air-cell expand nearly to the approximate conditions on top of Pike's Peak. I can then show you the biggest jump that an air-cell ever took—from the summit of Pike's Peak into the Atlantic Ocean! It is simply done by letting into the globe again our Denver air-pressure, and then adding three pounds.

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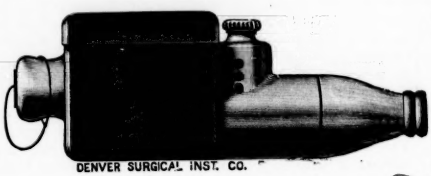
cially one just read before the American Academy of Medicine upon "The Advantage of Physical Education as a Preventative of Disease."

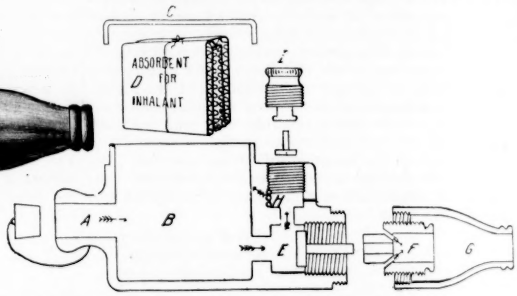
[3] Journal of the American Medical Association, Feb. 5, 1898.

[4] "Abnormal Intrathoracic Air-pressures and Their Treatment," by the author. President's address, American Climatological Association. See Transactions for 1890.

thereto. The contracted air-cell shrinking from the increased pressure around it, immediately suggests to the mind why it is that low altitudes favor lung inactivity, as it also suggests why it is that the contents of closed cavities, the brain and spinal cord, become congested with blood in the caisson disease.

It was not only as a possible substitute for, but as an imitation of and an aid to, the good mechanical effects of the lessened atmospheric pressure of high altitudes upon the pulmonary air-cells and blood-vessels in disease, that I devised the Inhaler and Exhaler[5] first described in the *Medical Record* in February, 1894. For convenience in pocket form, so that the desired mechanical distention of the air-cells and the needed lateral expansion of the thorax may be had every half-hour or hour in the day; for adjustability, possible according to the strength of the user, whether bedridden or an athlete; and for a means of reaching the air-cells and bronchial surfaces with volatile oils and salts, nothing that I know of has been contrived to equal this device.

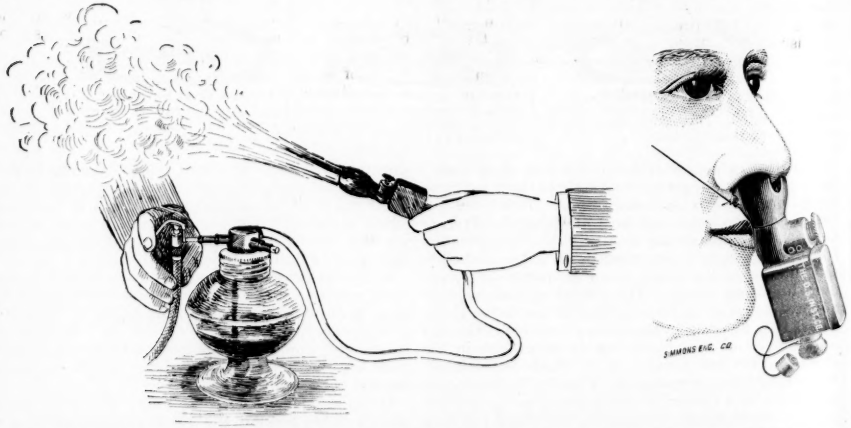




Physicians who have faithfully used this inhaler, have asserted that 15 per cent. of the benefit a pulmonary invalid may get from an average treatment, such as here outlined, is too small an allowance for the good received from this method of inhaling. The effects upon the spirometric capacities and manometer records of invalids, who have used it according to directions as to persistence and energy, have been indeed gratifying.

I have to show you here my own modification of the inhalation of finely atomized volatile oils, a method which is very popular with some physicians as an office means of treatment. Suppose you have by water, or other power, a pressure of 30 or 50 lbs. in your office compressed-air reservoir. This is connected thus with a globe inhaler bottle, having an instant cut-off interposed, and this vaporizer in turn is connected by another rubber tube with the Inhaler and Exhaler with nosepiece on instead of the mouthpiece. The delivery is made only during long, full inspirations, and the patient breathes back into the inhaler under a mild resistance of the exit value, so as to get impingement of the medicated inhaled air against all bronchial, throat and nasal surfaces.

There are any number of combinations of volatile oils and germicidal salts possible to be employed by



this method, but something like the following combination I have found to be most satisfactory for average cases:

℞. Ol. eucalyptus (Tyndale's) 20 to 40 per cent.; carbolic acid crystals 10 to 30 per cent.; oleum pinus Pumilio (Merck's) and liquid guaiacol (Schring & Glatz), of each 5 to 10 per cent.;

[5] The Denver Surgical Instrument Co.

oil of cloves and cedar, of each 2 to 5 per cent.; and formalin one-half to one per cent.

With this combination medicate your vehicle, whether it be liquid vaselin, glymol or albolin, to suit mild, ordinary uses. Then, for extra antiseptic or stimulating effect, the absorbent in the medicament box can be additionally medicated with formalin or other germicidal means for temporary use. This finely atomized spray you can see, as one who breathes it can feel, reaches all open spaces even to the ultimate air-cells, for considerable of the vapor returns with expiration, thus showing that some of the medicament has not been condensed. What proportion of it has been we do not know, but the results in tubercular affections, especially with "grip cold," hypertrophic rhinitis, ozena, laryngitis, bronchitis, etc., are quite satisfactory.

I have included an allowance for surgical interference, which is an important field in bone and joint tuberculosis, so-called scrofulous gland affections, lupoid skin diseases, laryngeal ulcerations, adenoid growths, tubercular pleurisies, etc. I must, however, here put in my protest against the surgeon's hasty interference in operating upon fistulæ-in-ano while tubercular infection is at all active in the lungs. I believe we should consider these fistulæ as eliminating means on the conservative order, and unless substitutive elimination is provided for, an operation should not be performed.

There is certainly no lack of opportunity for discussion with reference to our sixth and last subdivision of treatment, that of specific medication, for the very fact of there being any specific or antitoxin treatment of tuberculosis will be called in question. This opposition exists, notwithstanding there are on every hand around us, instances of acquired immunity to tuberculosis, though perhaps limited in degree. Wise professors will confidently state that it is "a will-of-the-wisp" to even seek such an agency as may be termed a specific for tuberculosis. Yet if the disease is due to a special toxin working in the system, it must be only through the development in that system of the appropriate antitoxin, or by the addition of it when created outside the body, that sufficient resistance can be had to stay the progress of the disease. Such resistance is what these opponents are after, whether by the means of tonics, exercise, or climates. Yet they would seemingly call in question the very source of that natural resistance, namely: the natural or artificially created antitoxic condition of the blood or tissues, which is antagonistic to further tubercular infection. These opponents then seem to admit the existence of a toxin, but deny that of an antitoxin.

Leaving open for discussion the question of fact as to the existence of an antitoxin or specific (for tuberculosis), created or existing outside the human body, I am going to assume that the creation of such an antitoxic agency in the affected or infected system is admitted, and that that existence or mode of resistance is in perfect harmony with nature's methods in eliminating other specific diseases.

We will then divide the antitoxin treatment of tuberculosis into two distinct methods: the *direct* and the *indirect*. These two should not be confounded with each other, as is the habit of some men in speaking of the tuberculin treatment.

The former, the direct method, is that inaugurated by Koch as the outcome of his discovery of the bacillus—the reputed cause of tuberculosis. Under the limited knowledge of the agency and of the disease it was to cure, this remedy soon demonstrated the need of an advanced chemistry in the technique of its preparation, and an enlightened skill in its administration beyond anything which existed in the scientific world. Since this discovery, the eight years of study and investigation of a few faithful observers, under most difficult and discouraging conditions imposed upon them by an onlooking and rather belligerent professional brotherhood, have served to develop a limited improvement in the particulars just named. I might say that this improvement in chemical technique, and afterward in administrative skill, had been considerable, if any due recognition of it had been manifest on the part of the medical profession as a body. This I will say, however: I firmly believe that tuberculosis could be held in check, if not cured, by this means, up to the proportion of, and even beyond, the 10 per cent. allotted to it in our table, if, with the present advanced technique in the manufacture of these direct tuberculin preparations the physician using them had the required knowledge to discriminate what patients could be treated by this method, and how far the treatment should be pushed. He should not only know the strength of his remedies, but also the *percentage of infection* with which he has to deal. It is a most gratifying and successful method of treatment if the condition favorable to its success can be secured. But the technique must be exact, and the general and individual objections to the use of such an antitoxin-creating remedy must be recognized. Thus, a knowledge of the applicability of the treatment narrows down its use to a small field. For instance, if the powers of nature are already overtaxed in an antitoxin effort, as in acute or miliary tuberculosis, nothing but harm can come from any increase of nature's burden.

It is likewise absurd to expect to reach with this treatment, closed or open spots, as cavities in the lung, or shut-in ulcerated regions where the blood does not circulate. And yet, most cases of pulmonary consumption harbor these conditions, many of which I believe are never recognized. If the treatment is inadvisable in caseous pneumonias and acute conditions, then I conceive it is quite possible that in some serious cases not acute, the massage, first recommended by the Germans as an auxiliary aid, may do damage by loosening up toxic material, and surcharging with it the blood already overloaded. However, if either incipiency of tuberculosis, or a chronicity, which is its equivalent—and chronicity brings equivalence because of some already acquired immunity—is known to exist, there is then no question but that the direct tuberculin method is the natural method of cure.

If time permitted I would elaborate this theme. However, I trust it will be acceptable to show a few of the cases I might call upon in this vicinity, who have become pretty thoroughly immunized against tubercular infection chiefly through this method. I have chosen ten cases, mostly those treated with Koch's crude tuberculin, from three to over six years ago, and have asked them to be present that you might verify their healthy appearance. These cases are purposely selected as those upon which the influence of climate has been very slight.

Case 1.—Miss N. S. over five years ago treated with Koch's tuberculin. Diagnosis then made with tuberculin, there being

no expectoration. Physical diagnosis then indicated: First stage both apices, and tubercular disease of the right hip-joint, due to injury four years previously; took as high as 160 mg. of tuberculin to the dose before a four months' course was ended. Had walked on crutches for over three years previously, but soon, and while under treatment, discarded them, Finally could step up-stairs, raising the injured limb first, something she had been unable to do for four years. Weight, strength and all symptoms improved during treatment—weight then 110½ pounds, now 146 pounds, and she walks without the limp she used to have. She has lived in Colorado since 1881, and climate had very little to do with it. This case is the same reported as case 2, "Favorable Results of Koch's Tubercular Treatment in Tubercular Affections that are not Pulmonary," in the *New York Medical Journal*, Aug. 3, 1895.

Case 2.—C. F. M. had been four years ailing, and had lived in the Rocky Mountain regions most of that time, when I first saw him in July, 1892. He was shown to be tubercular by microscopic examination of sputum; had a large cavity in right infrascapular region, say 2 by 4 inches in size and softening to the extent of excavation on opposite side, from which spots he was bleeding on any exertion. Had been confined in bed five weeks on that account. His hemorrhages were stopped by mechanical means; a properly adjusted harness or chest corset and tuberculin treatment was gradually instituted. This was distributed over different periods during the following two years, and he took as high as 240 mg. crude tuberculin for the largest dose. Accidents have occurred from mechanically straining the large cavity in his right lung, which cavity two or three years ago assumed the shape of a cucumber or banana. Three years ago, when, under protest, he went to live in Leadville, Colo., he had hemorrhages, and they have been repeated at other times, but his remarkable vitality and considerable immunity each time have brought him through. Of late years, without tubercular activity, this case has assumed the conditions of purulent bronchitis, *i. e.*, coexisting contracted cavity and bronchiectasis. There are now purulent evidences, but seldom any tubercle bacilli found in his abundant expectoration. Both of these cases are remarkable, and each by itself sufficient for a whole paper had we time to elaborate them.

Case 3.—S. T. B., in April, 1893, was brought to me by his father, who had come to take him home to Pennsylvania, as in Colorado Springs hope of his recovery had been abandoned. He had reached the stage of tubercular softening in both lungs and had been affected three years, the last six months of which time he had lived in Colorado. The susceptibility to crude tuberculin was gradually overcome and he took considerable quantities of this or the antiphthisin (Kleb's). Since his immunity became established he has enjoyed excellent health.

Case 4.—F. E. D. Period of incipiency uncertain, perhaps two years. Arrived in Colorado in July, 1895, when he had "mixed infection" bacilli in sputum and first stage of tuberculosis in left lung. Soon thereafter a small nodule came on scalp, in which, when it softened, a tubercle bacillus was found. While undergoing the first immunization with tuberculin he injured his elbow in a fall and that joint became tubercular during the resulting inflammation. The periostium of the ulna was affected, with probably some implication of the elbow joint, as, in a subsequent operation performed by Dr. C. A. Powers, some of the joint fluid exuded. After laying bare and scraping the bone, healing was greatly aided by a continuation of the immunizing process. This did not entirely remove the difficulty, and some two years ago a second operation was performed, at which time the ulna was drilled through and quite a piece of necrosed bone removed. The recovery under antiseptic packing and the treatment with antiphthisin was most excellent, only slight evidences of bone and joint disease remained and no trouble whatever with his lungs. A year ago he returned to his Vermont home. On coming back to Colorado last winter he had an attack of la grippe and that focusing agency in tuberculosis seemed to excite the latent disease of the affected elbow joint into activity. The swelling, immobility, pain and ulceration portended the possible necessity of resection or amputation. A very satisfactory test was made with crude tuberculin, warranting a renewal of specific treatment, this time with Von Ruck's purified tuberculin and ending with the "watery extract." Nothing could be more positively demonstrative of the good effect of the course pursued than the subsidence of swelling, soreness, lessening of the local discharge and general improvement which immediately resulted, in fact apparent complete recovery. Here is a study for those surgeons who scoff at tuberculin. It should convince them that there is a mild and immunizing power in this agency beyond their ken—something which may prevent the necessity of the use of the knife in many cases and perhaps warrant its use in others previously considered inoperable.

Case 5.—Miss N. McK. is another surgical case in which the influence of climate seemed to have already been exhausted, for she had nearly recovered from the lung disease for which seven years previously she had come to Colorado. This is the scrofula gland and first stage case previously reported.[5] In February, 1896, Dr. Powers, assisted by Drs. O'Connor, Pedersen and myself, removed from the right side of this woman's neck sixteen or seventeen glands which together filled a teacup. On that side they had commenced to ulcerate and there were nearly as many more on the left side, filling the depressions from the ear to the clavicle. These latter not being so far advanced, were deferred for a future operation. Encouragement to continue this immunizing process was afforded in the gradual shrinkage of the remaining glands and general improvement of the patient as treatment progressed. You see now, after two years only the remnants of those scrofular swellings on this left side.

Case 6.—J. T. U., treated March, 1892, for tuberculosis (bacilli in sputum), which seemed to have reached the second stage in the rear base of left lung. He had had some trouble, combined with pleurisy there, coming on for four years. Now he is a fine specimen of health. His treatment with considerable doses of crude tuberculin was before the discovery of any improved modification of the drug.

Case 7.—G. T. S. Treatment commenced before the last-named, six and one-half years ago. Reacted profoundly to 2 mg. crude tuberculin giving from the normal a temperature rise to 103 degrees F. The treatment was pushed and there were no reactions to the 20 mg. dose. It was continued to 50 mg. and then stopped. He has had little medical attendance since.

Case 8.—C. R., affected half a year when he came to Colorado, three and one-half years ago. He had pleurisy at base of left lung, in the apex of which softening had occurred, and there were first stage symptoms on right side, bacilli in sputum, etc. Since immunization three years ago he has gone through typhoid fever. His condition of health at the present time is something to recommend any course which will accomplish so much, even admitting climatic influence, physical exercise and faithful co-operation of the patient as aids.

Cases 9 and 10.—Husband and wife. Wife first treated four years ago and husband two years. Both had excavations; wife in apex of right and husband in upper part of the left lung toward axilla. Wife first treated with crude tuberculin; husband with antiphthisin. Both of these, for seeming loss or insufficiency of immunity, were again treated last fall with Von Ruck's "watery extract of the dead bacilli." Others of this list besides these two have shown the happy return to the tuberculin effect when a renewal of the treatment seemed necessary. A patient once benefited by tuberculin may in three months to two years reveal a certain loss of his acquired immunity, thus showing how relative to one's infection is his own resistance.

If a reason is required why so small a ratio of possible relief is attributed to this specific treatment by one who believes in it as I do, let it be understood that only a small proportion of the tubercular cases coming to Colorado are selectable for this method. It ought also to be recognized that the failures with tuberculin have been due not so much to inefficiency as to the lack of knowledge on the part of the physician how to discriminate cases fit for its use, as well as to a disinclination to attend to needed details in the technique of its administration.

I regret the lack of time to go more fully into details, and the necessity, therefore, to somewhat summarily dispose of the second method of the antitoxin treatment. This is the indirect method, wherein, instead of exciting in the human body a resisting antitoxin to a given disease, it is created in an animal and then given gratis to the invalid. In the former (the indirect) method there are two speculations which are severe enough tests to be sure: 1, the toxin remedy, and 2, the uncertain patient; while in the latter (the indirect) method there are three additional speculations. These are: 3, the choice of the animal, chiefly with reference to its natural immunity to tuberculosis, *i. e.*, whether the dog, goat, ass, horse or lion is best. In fact, to what extent a natural immunity to this disease, admitting that it must be relative to surrounding conditions, can be conferred

[5] The Microscopic Proof of a Curative Process in Tuberculosis, Transactions Colorado State Medical Society, twenty-sixth annual meeting.

through the blood serum to a human being, is an open and undetermined question. 4. The quantity and quality of the immunizing toxin to be administered to an animal whose serum is to be used. This is a reasonable speculation not yet removed from the realm of uncertainty. 5. The time said animal should be treated, both before the injections are stopped and afterward, before the blood is drawn, is an important speculative point. Dr. G. T. Hunter, who is present, has kindly presented me with some lion's serum, which was taken from an animal kept under the most favorable immunizing conditions up in the mountains of Germany. Treated nine months, at first with highly virulent doses of tuberculin toxin, with gradual cessation as immunity was reached, and a whole month allowed to intervene between the last injection and the taking of the serum. Whether that procedure is the proper one or whether with different animals this may not be waiting too long for the best results, is a question of speculative nature. The burden of proof as to these three extra objections rests with the advocates of this indirect method. My own good success with horse serums during the first four to six weeks' treatment of a dozen or more patients was perhaps due to personal precautions, *i. e.*, not increasing any dose which gave a reaction to the previous treatment, and not, as directed by the manufacturers, giving daily, but instead, every-other-day injections. The after evidence of the possible cumulative effect of such mixed foreign substances, introduced into the blood of a patient, led to a fear that the resistance to the disease in individual cases was overtaxed. The unfavorable results of other physicians, who crowded this treatment according to recommended rules in printed directions, served to confirm the conclusion that an antitubercular serum is a mixture, the exact proportions of the converted toxins or antitoxins in which we do not fully understand. The serum treatment of tuberculosis, as yet, is a beautiful dream, which I for one profoundly hope will be realized.

Pardon the extension of this paper and do not lose sight of the arbitrary divisions of treatment given in the table presented for the purpose of bringing out in discussion your various views.

To sum up, the following conclusions are advanced:

1. As a part is greater than the whole, the combined method is superior to any given branch of the treatment. The individualizing process, and the adaptation of all methods to the needs of a given case, is the preferable plan.

2. The seasonable change of residence to a well-selected high-altitude climate, with its dryness, sunshine, possibilities of out-door life, and its stimulating qualities, gives the best possible resistance to the advance of consumption.

3. Exercise is most essential and necessary to promote both cell activity and the needed mechanical distention of the air-cells.

4. Local treatment and proper inhaling methods bear important relation to exercise, cell stimulation and the climatic effect by the high altitude method.

5. A great and most valuable addition to our curative means comes through the skillful determination of the proportion of infection, in order to know the balance between bodily resistance and the disease. This balance is the key to the as yet preferable—the direct—method of specific treatment.

6. It is a mistake to overwhelm the body with frequent injections of undetermined animal serum, thereby producing either a severe reaction or a possible cumulative toxemia.

ANTITUBERCLE SERUM (PAQUIN) IN TUBERCULOSIS.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY WILLIAM HUTSON PRIOLEAU, A.M., M.D.
SUMMERVILLE, S. C.

At the forty-seventh annual meeting of the South Carolina Medical Association, held in April, 1897, I had the pleasure of making a detailed report of cases of tuberculosis treated with antitubercle serum (Paquin); this report was afterward published in the *New York Medical Journal* of June 26, 1897. In this paper I shall endeavor to add to that report by giving my conclusions as drawn from a three years' experience with this serum. I shall try to point out when to use it and when not to use it; also that it is not a specific, but a treatment of inestimable value when used in conjunction with good climate, diet, etc.

A careful observer can not fail to notice that one by one the diseases which in years gone by have produced the greatest mortality are now slowly but surely yielding to science and scientific treatment. This is all the more true because we are giving up empiricism for rationalism; drugs are used less and antitoxins more. All of us rejoice in the antitoxin for diphtheria, and use it because the American Pediatric Society has put the stamp of approval on it; many of us use antitubercle serum (Paquin) because we have tried it and found out its value from clinical observation and by actual experience. Dwelling as I do in a winter resort for consumptives, naturally I see a great many cases each year. Since beginning the practice of medicine at Summerville, S. C., I have been anxiously looking for some treatment to benefit these poor unfortunates, if not cure them. Various kinds of treatment have been vaunted to the skies, but none has given me the real satisfaction that antitubercle serum (Paquin) has. I have used it for three years, and during that time I have alleviated the sufferings of many, prolonged their lives and seemingly in some cases have produced cures. I say seemingly, because three years is too short a time to say positively whether one has been cured or not. In order to test the serum thoroughly, I used it on all cases that came into my office, irrespective of the stages. In this manner I treated twenty or more, only one being in the incipiency; out of this number all but two were benefited, some being temporarily cured, others apparently cured. The cases were pulmonary, laryngeal, glandular and joint, and the serum acted equally well on all. It is, however, as well to know when not to use the serum as when to use it, because on its proper application depends its value. From my own experience I have come to the following conclusions, viz.:

1. That antitubercle serum (Paquin) is nearer a specific for all kinds of tuberculosis than any other treatment.

2. That it is most valuable in pure, unmixed tuberculosis; that is, tuberculosis uncomplicated with some infection.

3. That it ought to be used in the pretubercular or incipient stage and in the beginning of second stage.

4. That it ought not to be used with great hopes

when there is a daily rise of temperature to 102 degrees.

5. That given by the rectum the results are equally as good as when given hypodermically.

6. That rectal injections never cause any unpleasant symptoms, as are occasionally produced hypodermically.

These conclusions, as I say, are based on actual experiments in private practice, and necessarily must be of value to any one using the serum. Most of us, when giving a new treatment a trial, are apt to use it on an old case as a last resort, everything else having been tried. This helps neither the patient nor the treatment; perhaps it may benefit the former a little, but most assuredly injures the latter. It is also of great importance for us to make an early diagnosis in all cases, and if possible to begin treatment in the pretubercular stage. Each and every year many precious lives are sacrificed on the altar of physicians' carelessness in examinations. No matter how slight the trouble may be, he ought to be able to locate it. Our examinations should be both physical and microscopic. It not infrequently happens that on physical examination we detect a lesion, and at the same time a microscopic examination of the sputum fails to show up the tubercle bacilli. One examination in such a case should not suffice; we should make them at stated intervals until some positive diagnosis can be made.

In tuberculosis all of us recognize a wasting disease; such being the case, we must not only endeavor to arrest or destroy the germs by antitubercle serum, but also endeavor to surround the patients with such conditions as are most conducive to convalescence. I shall not dwell on this point, I only wish to call your attention to the fact that this antitubercle serum deals only with the tubercle bacilli, and that it is also necessary in addition to put the patient on flesh-producing food, tonics, and in a good climate. It has been my experience that tubercular patients improve more rapidly in a low altitude than in a high, because as a rule they all have weak hearts, and the higher the altitude the more strain on the heart. I shall not weary you with a detailed report of all my cases, but there are four to which I would like to call special attention:

Case 1.—Young man, aged 28. First hemorrhage in October, 1897, followed by fever and night sweats. Cough troublesome. No appetite. Came to Summerville in March, 1898. Put him on the serum treatment—rectal injections. Improvement began almost immediately. He was allowed to return to his home in Georgia to carry on the treatment. Last reports of his condition are good. Says he has never felt better in his life and weighs more than his average weight.

Case 2.—Male, aged 28 years. Family history good. Contracted phthisis pulmonalis in February, 1895, after having been weakened by two successive attacks of grip. Physical examination showed one spot on apex of right lung, and another in lower part of upper lobe of left lung, posteriorly. It was a typic case, with fever, cough, night sweats, hemorrhages, etc. The patient was ordered in May, 1895, to the mountains of North Carolina, where he passed the summer with little or no benefit. He then came to Summerville in the autumn and remained for two months, when tuberculosis of the hip and testes developing, he was advised to go to Charleston for the purpose of having an operation performed. There his testes were operated upon, but he refused to have his hip joint opened. The pain in the hip had become so intense that the slightest movement in bed would cause extreme agony. At my earnest request the physician in charge kindly consented to treat him with Dr. Paquin's serum, and it was not very long before his hip became much improved. So great was this improvement that in a few months the patient was enabled to walk without the help of crutches and with absolutely no pain. In every respect he continued to improve and finally in March, 1896, he returned to Summerville. There I continued the serum treatment until the hot weather set in, at which time, for numerous reasons, I stopped it. Not three weeks after its discontinuance the patient developed tuberculosis of the brain, which in the space of two weeks caused his death.

This case is interesting in many points. First the development of tubercles in the lungs, followed by tubercles in the testes, hip and brain; also because of the marked and immediate relief furnished him by Dr. Paquin's serum. And lastly, because it was the only case in which I have observed alarming symptoms caused by a hypodermic injection of the serum.

Case 3.—Woman, aged 35 years. Family history negative. Patient had suffered from repeated attacks of the grip. In the last four years it was her custom to come south for the winter season. An examination revealed a lesion in the upper part of the right lung, I could not say whether it was tubercular or not. A careful examination of the sputa did not show tubercle bacilli. There had been no improvement in health during the last three winters, so in 1897, I placed her under the serum treatment. Immediately after using this serum improvement became quite noticeable, and after three months' treatment I allowed her to return home; not, however, without cautioning her to be extremely careful with herself, and for the next year to use twice a week rectal injections of Dr. Paquin's serum, forty minims at a dose. In March, 1898, this patient reported continued improvement.

Case 4.—Male, aged 25 years. Family history poor. Father and sister had died of phthisis pulmonalis. Patient has had a cough all his life. In June, 1896, he had several hemorrhages; also fever, night sweats, cough, etc. On examination I found consolidation in upper part of lower lobe of left lung. I immediately put him under the serum treatment, with no other medicines. Very soon his hemorrhages ceased, his night sweats were arrested, and his fever left him. His appetite was restored and his strength renewed. Improvement continued until the summer, when the injections of serum were discontinued because of the great difficulty in keeping the serum fresh. In the fall I commenced to inject him again, and since that time he has steadily improved. His gain in weight is eleven pounds, and he coughs only when the atmosphere is damp and moist. I advised him that he could return to his work, but that for the next year he must use the serum by rectal injections twice a week. This case is worthy of observation, because of such a brilliant and successful result in one who so strongly inherited a predisposition to tuberculosis.

April, 1898.—During the past winter he has coughed a great deal, owing to a discontinuance of the serum contrary to my advice, but is now better and at work again, having resumed the serum treatment.

Finally, I want to say again that another year's experience with antitubercle serum (Paquin) has convinced me more than ever of its merits, and I feel sure that after giving it a fair trial you will likewise be convinced.

THE STUDY OF MATERIA MEDICA AND THERAPEUTICS.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY HENRY M. BRACKEN, M.D.

Professor of Materia Medica, Therapeutics and Clinical Medicine, University of Minnesota; Secretary and Executive Officer of the Minnesota State Board of Health.

MINNEAPOLIS.

My views upon the subject were given under this title in the *New York Medical Journal*, May 2, 1896. Some points set forth will be emphasized in this paper. The object of study is twofold: first, to train the mind; second, to give the student knowledge that he can make practical use of. In this age of utilitarianism, the first object is often lost sight of. Teachers of medicine and surgery may even speak of the study of materia medica as useless. Their opinion is based upon the fact that the older one is in the

practice of his profession the smaller will be his list of therapeutic agents. They argue that a student will pick up the necessary knowledge relating to important drugs, in connection with his clinical studies. This is certainly a mistake. The best therapeutists are men who are thinkers, not machines. The practitioner who uses a therapeutic agent because he was trained to do so by his clinical teacher in his student days, will soon become a back number. The agent may have been the best of its kind in his student days, but the rapid progress that is now possible in therapeutic knowledge may soon displace supposed valuable products by others which prove themselves of greater value. Therapeutic knowledge is becoming more exact each year, and this is due largely to the work of the pathologist and the physiologist.

There are three methods of teaching materia medica: by lectures; in the pharmaceutical laboratory; in the physiological laboratory. It is quite common for a school to adopt one or the other of these three methods, to the exclusion of the other two. This is a mistake. No student should commence the study of materia medica unless he has had at least a year's work in chemistry and physiology. This would prepare him to understand the terms that are in constant use in the study of drugs. The lecture room is the place to begin the study of materia medica. The process here is one of general instruction, of bringing together the important chemic, physiologic and pharmaceutic facts. Drugs that have little value can be described briefly by the lecturer, and then receive but little further consideration by the students—possibly never be thought of again, or possibly be brought out and used to good purpose at some future opportune moment. The important drugs should be given due prominence by the lecturer. It would be hard for the student to grasp the necessary points connected with the study of drugs were he to depend upon his own judgment, but a few words from the lecturer should make the way clear to him. Without such help the student would have to wade through a mass of material, and would be unable to separate the wheat from the chaff. For example: consider the study of opium. Without a guide a student would be thoroughly confused by the number of active principles and pharmaceutic preparations. Let the lecturer go over this subject with his class, drawing attention to the fact that a knowledge of a few of these preparations is quite sufficient; that, in fact, it would be no great loss if one knew nothing of the opium preparations, provided his knowledge of morphin was accurate. The use of any opium preparation is to secure the action of morphin, so that direct dosage with morphin should be more satisfactory in every way than the use of opium in any form. So also with the preparation of iron. The uncertainty as to the true therapeutic explanation of the action of iron, together with other bases for theories, has been an excuse for introducing a remarkable list of preparations, official and non-official. The student is quite embarrassed by this display of titles. A few words from the lecturer, however, may reduce this confusion of the iron preparations to a few simple principles—stability, local action, remote action, etc.—and thus make the actual knowledge required an easy matter. All these points are as easily given, by lecture, to a room full of students as to small sections of a class. There is also a great saving of labor by this method. The lecturer thus paves the way for the laboratory instruction. In laboratory instruction, pharmaceutic work should be taken up first. This should be taught by a medical man with a pharmaceutic training, rather than by a pharmacist with a medical training, otherwise the pharmaceutic knowledge imparted to medical students is apt to be overdone. The teaching should be most practical. The course must necessarily be short, for there are many other important things to take the student's time. The medical student does not need to be a pharmacist, but he must have sufficient pharmaceutic knowledge to enable him to write prescriptions intelligently.

After the pharmaceutic training, the student is ready for the physiologic laboratory, where he may study drug action. This should be the most interesting part of his work in materia medica. It is the most difficult part for the instructor. The work must be done by the class in small sections. The experiments, even in the hands of trained men, are often failures, for one reason or another. This work often takes a great deal of time and yields very poor return from the student's standpoint. The study of the physiologic action of drugs is by no means a simple task, and it is an open question whether it might not be better for the general medical student to accept the conclusions of some eminent physiologist, as to the physiologic action of drugs, rather than try to demonstrate such action for himself. It is a question whether the study of drugs in the physiologic laboratory should not be limited to demonstrations, by the instructor, of a few important truths. It certainly is a question whether the student's individual work along this line should not be classed with the advanced work of the senior year, if taken up at all. He may then be able to apply his combined student's knowledge to the task before him. It is even a question whether the special physiologic laboratory study of drugs should not be made an elective course, so that only those who have a special liking for such work would take it up.

Thus we have the work of the lecturer and of the laboratory instructor combined. The lecturer is an educator in the broadest sense; the laboratory instructor is a practical demonstrator, more important, in a way, than the lecturer, but more restricted in his work.

The student is now prepared to take up his work in therapeutics. This naturally comes in the third year of a four years' course. Therapeutic agents are best studied first in groups, according to action, as anodynes, antipyretics, analgesics, etc. The demand for a therapeutic agent naturally suggests one of these groups. In each group there will probably be but three or four important therapeutic agents. The student learns naturally, through this arrangement, to eliminate those that are unimportant. At the same time, a little reasoning will enable him to appreciate the advantages one agent may have over another of the same group, in any given case. It will also prepare him for the necessity, which sometimes arises, of changing from one agent to another of the same group, under certain conditions, in order to secure the best drug effect, and at the same time, to avoid establishing either a drug tolerance or a drug habit. When the student learns his therapeutics in this way, he will have little inclination to become a prescription copyist, and his tendency will be toward the writing of simple prescriptions, rather than toward polypharmacy. In this system of teaching therapeutics, it becomes unnecessary for the instructor to

devote time to the therapeutics of each and every drug separately. He gives, in common, the points to the whole group, and then points out the advantages and disadvantages, the importance or the uselessness, of each agent in the group. Naturally, he would devote a considerable time to the therapeutic properties of the important agents. In connection with this course, the student must become familiar with prescribing. Three methods of using drugs are now in vogue: the hypodermatic method; the bedside dispensing of drugs; the use of prescriptions. The student would readily become familiar with the first and second methods. The third method is a little more difficult to follow. Instructions should, therefore, be given in prescription writing, drawing attention, not only to the action of drugs prescribed, but to the form of prescription, compatibility of parts, both chemically and physiologically, and last, but not least, if the prescription is for internal use, its palatabilty. This work should place the student in good form for his duties at the bedside.

The work that I have so far outlined, as belonging to therapeutics, should occupy time extending through the third year of a four years' medical course. In the senior, or fourth year, the work in therapeutics should be continued, but along very different lines from those pursued during the previous year's study. There should now be an application of the knowledge which the student has already acquired. The therapeutic teaching should be connected with clinical work. It is not enough to study a case simply to arrive at a diagnosis. That may satisfy the physician's curiosity, but it will not satisfy the patient. Something must be done to cure the patient, if possible. If this is not possible, it is at least necessary to do all in one's power to guard against complications, to pilot the patient through to a safe termination of his troubles, or to at least produce euthanasia when dealing with those cases where death is the only ending for suffering. There are nihilists in therapeutics, but these are men who are not willing to consider the comforts of their patients. We should take great pains not to have any therapeutic nihilists among our students. The instructor in therapeutics for this final work should be a clinical teacher, one who appreciates the points I have just referred to as bearing upon the comfort of his patients.

I have thus outlined the teaching of materia medica and therapeutics to extend over a period of three years. This has not been with the purpose of loading a great deal of work upon the medical student, but rather of giving him a little at a time, in order that he may understand the subject thoroughly. The work could be done in one year, as far as time is concerned, but it would then be simply a process of cramming, and the results could not possibly be satisfactory.

SOME PREPARATIONS OF THE NATIONAL FORMULARY.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics at the Forty-ninth Annual Meeting of the American Medical Association held at Denver, Colo., June 7-10, 1898.

BY C. LEWIS DIEHL, PH.M.

LOUISVILLE, KY.

At the meeting of this ASSOCIATION in 1893 I had the honor to read a paper[1] before this Section, in which I outlined some of the conditions that have had marked influence upon the practice of pharmacy in its relation to that of medicine. I pointed out that the modern practice of prescribing medicaments of special manufacture had become a burden upon the pharmacist which, if not relieved, would surely end disastrously to those who, adhering to the ancient landmarks, strove to supply their patrons with medicaments of their own manufacture or of generally recognized and officially accepted composition. Indeed, the thought has impressed itself more and more upon my mind, that if physicians had entered into a conspiracy to drive the educated and qualified pharmacist out of business, they could not have pursued a more certain method than that which has become a common practice during the last decade. In my personal experience, drugs, chemicals and pharmaceutical preparations which were considered indispensable under the older practice now remain unused on the shelves or become ruined before they can be disposed of; and this in face of the fact that these same drugs, chemicals or preparations are the component parts of, or are represented by, the preparations of special manufacture now popularly prescribed.

So simple a drug as gentian root is made into a palatable and sightly preparation by the aid of some aromatics, wine and glycerin, and, with the assurance of the manufacturer that it has taken years of study to perfect the formula, it is at once successfully launched into popular favor among prescribers, and takes the place of old and well-known preparations over which the new one possesses no tangible advantage. But a more serious manifestation obtrudes itself as a consequence of the modern practice. Formerly the physician, confining his prescription to drugs, chemicals and preparations of officially recognized quality and composition, knew exactly what he was prescribing and the patient accepted his prescription without inquiry. Now, the patient is familiar with the name or title of the medicament that is being prescribed for him, and is more than likely to ask for it without prescription, while neither he nor the physician has a true knowledge of its composition; for such knowledge is in most instances based upon more or less obscure or misleading statements borne upon the label or upon the circular accompanying the preparation.

Under these conditions it is not to be wondered that the purely commercial element has overwhelmingly gained ascendency in the practice of pharmacy and that the professionally inclined are largely in the minority, I was about to say hopelessly so, but I am unwilling to concede that. I have occasionally met with the statement that, as applied to politics, the minority is always in the right. However this may be of politics, I am not sure that it applies with like force to the revolution that has invaded the practice of pharmacy; but I do believe that, with persistent effort, and with the aid of thinking men in the medical profession, the minority will eventually lead the majority into channels in which the commercial shall be subservient to the scientific and professional qualifications. Among these efforts perhaps the most important is the successful introduction of authoritative formulas for the preparations that are now popularly prescribed, and the acceptance by physicians of the preparations made in accordance with such formulas by reputable pharmacists everywhere. This has been the aim of the American Pharmaceutical Asso-

[1] "The National Formulary." Read by invitation in the Section on Materia Medica and Pharmacy at the Forty-fourth Annual Meeting of the American Medical Association.

ciation in compiling and issuing the "National Formulary," a work which has been completely revised since the date of my paper initially referred to, and which has in some degree at least met with recognition by the medical profession. In fact, in some localities, where its merits have been properly presented to physicians, it has been accepted as authoritative for many preparations to replace those of special manufacture, and as the work becomes better known its usefulness will doubtless be extended. In furtherance of this object, and with the hope that the work may become more generally known and appreciated by prescribers, I therefore venture to again call the attention of the AMERICAN MEDICAL ASSOCIATION to the "National Formulary," illustrating its utility and scope by brief comments on a few preparations that seem to merit attention and to serve as types of the general contents.

With a list of eighty-six formulas for elixirs, forty-seven for syrups and forty-four for liquors, one should consider the ground of modern so-called elegant pharmacy pretty well covered; but the list utterly falls short of the number which enterprising individuals have succeeded in introducing to the notice of practitioners of medicine, and which must be kept in stock in a modern pharmacy. The difference between the one and another is in many cases that between "tweedle-dee and tweedle-dum," the selection by the prescriber being quite as much due to convenience or whim, and in neither case justified, when the identical components on the shelves of every properly appointed pharmacy may expeditiously be compounded into a palatable and acceptable preparation. It is true that to construct his own formulas will put the prescriber to some inconvenience! In some cases he will probably be compelled to consult with his neighboring pharmacist so that the resultant prescription may be sightly and palatable as well as efficient. But the trouble is well worth the taking, for his results in the treatment of disease will be based entirely upon his own selection of the medicament instead of, as is too frequently the case, upon that of the manufacturer. If then, the prescription having become established to his satisfaction, the physician will take the trouble to write out the components when prescribing, he can reasonably hope to have his prescription prepared acceptably at any respectable pharmacy; or in case the formula is too lengthy and circumstantial, its publication in some of the numerous medical and pharmaceutical journals will make it public property, as it should be, and the preparation may then be prescribed under a selected title. Unfortunately the practice has gained ground modernly that formulas constructed under the conditions named are being withheld from publicity and a new child is thus born to enrich the modern materia medica, in most instances under a coined name and with the corner druggist as its sponsor.

It would necessitate a far more lengthy paper than is contemplated or useful at this time to go into details concerning the composition of the preparations of the "Formulary," for these details mainly concern the operator to whom the compounding is entrusted. The prescriber, however, should fully understand that the operations involved are in most instances of the simplest character, the formulas are constructed on simple lines, and the directions are given in terse diction and with such precision that the merest tyro, so long as he has the ability to weigh and measure correctly, can follow them to a satisfactory end. It is otherwise, however, when the exigency for a new formula arises, whether it be for the purpose of simply combining an additional medicament with a preparation already made, or whether it be with the object of exhibiting one or more medicinal agents in a more acceptable form. Here a thorough knowledge of compatibles, both in a chemical and physical sense, is necessary, and the opportunity arises for consultation between the prescriber and the pharmacist. Take, for example, Elixir of Ammonium Valerianate. (Formula No. 33.) It is important that this should be perfectly neutral or slightly alkalin, so that the odor of valerianic acid may be completely overcome. Properly prepared, it may be combined with any neutral or basic medicament without impairing its quality, but if we were to add an acid substance, the odor of valerian would be immediately developed and the utility of the preparation impaired. Again, the finished preparation may require the presence of a free acid, for example, the Compound Digestive Elixir. (Formula No. 59.) This preparation containing both lactic and hydrochloric acid in a free state, it will not do to combine it with basic or alkalin substances, though neutral or acid compounds are perfectly compatible. In other cases the judgment involved may concern the physical character, such as taste and odor only, an example of which is the Compound Cathartic Elixir. (Formula No. 45.) In this we have the problem before us to make a palatable preparation from a number of bad-tasting or malodorous drugs, such as senna, mayapple, leptandra, jalap, etc., which is successfully solved by the judicious use of the Elixir of Taraxacum (Formula No. 111) and of Elixir Glycyrrhiza (Formula No. 76). Numerous other examples might be cited, but sufficient has been said to point out how the physician and pharmacist, with the material provided in the "Formulary," may acceptably produce almost any combination that may be desirable.

The "Formulary" also commends itself on the score of economy. Many of the preparations can be made extemporaneously, or at short notice, with such materials as are on the shelves of every well-appointed pharmacy, there being only a list of ten preparations—in themselves inexpensive—which for the convenient preparation of the others are advised to be kept in stock. This facility to make palatable preparations at short notice also commends itself on the ground that they will reach the patient in an absolutely fresh condition, and particularly so in the case of two classes of preparations—the "Emulsions" and the "Effervescent Powders." Possibly both of these have had their day, for they are not prescribed with nearly the frequency they were formerly. But for that very reason it is desirable that the pharmacist should be placed in position to dispense them in a fresh condition, since both of these classes of preparation rapidly undergo change and become unfit for use; and being usually dispensed in original containers and under seal, it becomes practically impossible to insure their quality. The "Formulary" makes excellent provision for both. With regard to

Emulsions, it observes that "the successful formation of emulsions, whether of fixed or volatile oils, is most successfully and expeditiously accomplished with acacia as the emulsifying agent." Hence, preference is given to acacia, though other emulsifying agents, such as mucilage of Irish moss, mucilage of dextrin, glycerite of egg and tincture of quillaya, are not

ignored, their use and application being exemplified in a number of alternative formulas for preparing Emulsion of Cod Liver Oil. The directions given are so plain and explicit that they may be readily followed by the operator with assurance of the production of an emulsion containing 50 per cent. by volume of the oil, together with such other medicinal ingredients, hypophosphites, flavoring, etc., as it may be desirable to incorporate. In the case of "Acacia Emulsion" the amount of the acacia need not exceed 12 per cent., while the emulsification is as perfect as in the best emulsions of the market, and far more so than is the case with the most of them. Good, pure material is easily obtained in the market, and will certainly be supplied by the pharmacist if the physician will take the trouble to make the demand for the pharmacist's rather than for the manufacturer's product. As to

Effervescent powders, the "Formulary" maintains that they are most conveniently and efficiently dispensed in the form of *fine powder*, because in this condition they can be made extemporaneously and with an assurance of their freshness and efficiency. The popular demand for "Granular Effervescent Powders," however, is not ignored, and formulas are given for their preparation under modifications which are important only in so far as they enable the dispenser to granulate the powder in a convenient and expeditious manner. But the granulation of the powder is admissible only if it is contemplated to prepare the effervescent preparation for stock; and the liability of such to deteriorate on keeping, being the same as that of manufactured effervescents, should prompt the physician to discourage their use, by confining his prescription to extemporaneously prepared effervescents *in fine powder*. The latter can be made as quickly as any prescription that requires the admixture of several powders. To make the plain (non-medicated) effervescent powder, two stock powders, the one composed of sodium bicarbonate and sugar (Saccharated Sodium Bicarbonate, Formula No. 341), the other of tartaric acid and sugar (Saccharated Tartaric Acid, Formula No. 8), are mixed in equal quantities by weight, the proportions of acid to sugar and of alkali to sugar being such that, weight for weight, the two powders represent molecular proportions, and when so mixed form a neutral solution. Both of these powders, when made from dry and anhydrous material will keep indefinitely, but may be prepared expeditiously if not in stock. The medicinal agent having been weighed and finally pulverized if necessary, with a small portion of the plain effervescent powder, a sufficient quantity of the latter is then incorporated to make four grams for each dose contemplated, and the resultant powder may then be dispensed in bulk, to be given in doses of a teaspoonful, or, better, divided into doses of sixty grains, each dose to be enveloped in wax paper. Obviously, any desired medicinal combination of dry, soluble substances can be thus prescribed, a typic prescription being as follows:

℞ Citrated caffein . . . . . 12 gr.
Lithium citrate . . . . . 24 gr.
Saccharated tartaric acid (N. F.) . . . . .
Saccharated sodium bicarbonate (N. F.) āā 3 dr.
Mix intimately and dispense in twelve equal parts (or in bulk) each enclosed in wax paper.

The advantages resulting from the practice of so prescribing are:

Accuracy, because the composition is determined by the prescription.

Celerity, because the prescription can be prepared from stock at hand, and there is no delay in searching the market for a specialty.

Efficiency, because the medicine is freshly prepared.

Economy, because the prescription need not exceed a single dose, and there is no loss from deterioration. But not the least of the advantages to be gained from this practice is that the physician and pharmacist are kept in touch with each other, instead of—as is inevitably the case under modern practices—drifting asunder.

THE PONS ASINORUM OF THERAPEUTICS.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics at the Forty-ninth Annual Meeting of the American Medical Association held at Denver, Colo., June 7-10, 1898.

BY ROBERT G. ECCLES, M.D.

Member of Committee of Revision of the United States Pharmacopœia, 1890-1900; Fellow of the American Association for the Advancement of Science; Member of the Scientific Alliance of New York; Member of the American Chemical Society; Member of the American Anatomical Association; Managing Editor of the American Medico-Surgical Bulletin; Member of King's County, New York, Medical Society; Member of the American Pharmaceutical Association, Etc.

BROOKLYN, N. Y.

In the fifteenth century one Johannes Buridan published a treatise which he called the *Summula de Dialectica* and set forth to the public that it would enable any person, however stupid, to easily and rapidly discover the "middle terms" for syllogisms. On the strength of this claim it came to be known as the *pons asinorum* or bridge for what our Colorado friends call "burros."[1] At a later date the fifth theorem of the first book of Euclid came to bear the same title, and still later the forty-seventh proposition of the same book bore this name because they enabled dull students to master otherwise very difficult problems. In modern parlance a *pons asinorum* is a bridge over a mental difficulty that enables ordinary mortals to cross. Geniuses can, of course, get over without such aid. In using it in therapeutics the writer denies any intention of intimating that there are any members of the medical profession whom he feels justified in cataloging as belonging to the genus *Equus*, species *asinus*. We merely use it for the purpose of forcibly indicating the sad need of such a bridge at this point of medical progress. Without it we have the choice of resting entirely in a fool's paradise, taking wings and soaring with the geniuses over the muddy stream of ignorance or remaining mental grallatores floundering in the deep waters of that practically unfordable stream. It is not the first time in the history of science that such alternatives have been placed before mankind. As a rule the majority prefer to remain within the fool's paradise. The subjective method of the metaphysician is much more congenial than the experimental, objective method of getting at truth or what the world considers truth. In therapeutics we are all as anxious to discover a law of cure as were the alchemists to discover the elixir of life, but we of the regular school prefer the inductive, slow method of chemistry to the wild dreams of alchemy. Any pretended therapeutic law that fails to come down to the bed-rock of cause is a mere hallucination. When we can trace by cause and effect exactly how remedies produce their results, then and not till then will we have a true law of cure. We are already sufficiently far

advanced to see the way in which it is likely to be found and to observe where our pons to it is being built. The caissons have already been sunk through the muddy bed of ignorance, and we shall soon see its graceful arch spanning the stream below. In this essay the author hopes to be able to show: 1. That all effective therapeutic measures are preventive ones, depending almost wholly on our ability to make a correct diagnosis. 2. That our present paucity in successful results is due to defective diagnosis. 3. That we cannot overcome this defect, so far as the great majority of medical men is concerned, until we are supplied with a binomial or trinomial nomenclature of diseases.

The therapeutic bridge we need is a scientific system of naming diseases so that the average medical man will be able to know what he is trying to get rid of by the remedies he uses. Our present lack of system is a sad hotchpotch, that if merely useless might be tolerated, but that being positively misleading should be consigned to oblivion as quickly as possible. In medical matters we stand today precisely where botanists and zoölogists stood before the immortal work of Linneus was accomplished. Our confusion is as great as theirs was and our gain from a similar revolution would be far greater. Now is the time for us to inquire "where we are at" and try to get order out of the awful chaos that surrounds us. If something is not done soon, we will all be constrained with Cicero to exclaim, "*O dii immortales! ubinam gentium sumus?*" (Ye immortal gods! where in the world are we?)[2]

The number of causes capable of producing bodily ailments is infinite. Fortunately there is a natural grouping by which it is possible to place them all in a few convenient classes. Some are due to mechanical, some to chemic and some to biologic (usually microbial) injuries. If we add to these causes those due to errors of development, we will probably have covered every possible form. In consonance with this grouping of causes there can be a corresponding grouping of effects, thus enabling us to have what we are pleased to call distinct diseases. There are in reality no such things as distinct diseases. Disease in all its protean forms is but the resultant effects of a multitude of causes, being resisted by the organism. As effects often mimic each other, it is never possible for us to be absolutely sure of the nature of any disease until we have discovered its exact causes. The first step toward a rational course of treatment is the step that leads us toward knowing what we have to treat. Until we discover that, what we happen to do is little better than blind guess-work.

To make clear our meaning consider for a moment two illustrations. Suppose we go home and find our window broken and go in search of the cause of the break. It may have been the wind, it may have been a stone, or it may have been any one of a multitude of causes. To discover that it was done with a stone does not in any way help us toward a knowledge of how to mend it. In cases of this kind a knowledge of the cause of the disease or damage does not help us to a knowledge of the remedy required. Now let us change our supposition a little. Instead of a broken window let us choose broken ice on a skating pond. Being anxious to see that pond frozen over we look out upon it from time to time on a cold winter's day and each time discover a huge hole at the same point on its surface. We go out near it in order to discover the cause and find that it was being pelted with stones. No sooner was new ice formed than it was broken again by a large stone being thrown through it. To discover the cause in this instance is to discover how to remedy the evil. As soon as we stop the stone-throwing the break closes.

Here we have a case of cause and effect exactly like those with which physicians have to deal. The same class of forces can operate to damage organisms as operate to damage ice, and the process of mending, healing or curing is exactly analogous in both instances. Observe here that the mending in the one case and the curing in the other is accomplished by inherent forces. All that we can do in either instance is to remove some continuously operating cause or causes and then nature does the rest. In the case of the broken ice a cure of the evil occurs when we stop the stone-throwing. In the case of our patient the cure occurs when we stop the action of the damaging force. The ice can cure itself by freezing so fast that between the intervals of stone-throwing it becomes thick enough to resist the blow. The body can cure itself if its repairing forces work with sufficient vigor to render nugatory the attacking causes. Both the human body and the ice do their own repairing of damage always. We can only remove the obstruction and overcome the causes that hinder their inherent activities. Whenever any cause interferes with the development of a clear crystal of ice or a pure healthy body that cause must be removed or no cure is possible. Sometimes many causes may be at work simultaneously damaging the ice or damaging the body and then all of the morbid causes must be removed before nature can assert herself by a cure. At other times different damaging causes may succeed each other, the first, second and third having disappeared and a fourth having come in to keep up the mischief. In the case of the ice a succession of stones may have been succeeded by a fire and this again by sulphuric acid. All of these may have done their share toward damaging the ice until finally a mass of salt may have been placed upon it. To cure the damage it will do no good to remove the spent stones, the extinguished fire or the saturated acid. We must know that there is fresh salt there and remove it. Thus it is in the body. The first injurious cause may have gone when we are using remedies for it. It is necessary to know the cause now acting and seek to remove it. If we find a person being burnt we can extinguish the flames. If we find that acid has been thrown upon him we can stay its ravages by removing it or neutralizing it. When there is no longer any fire or acid present we must see that the damaging air does not affect the wound and when this is looked after we turn our attention to the invading bacteria so as to arrest their destructive work.

The kind of microbes that invade the wound may have an important bearing upon the healing of the wound. To successfully treat each case we must know the kinds that invade it. All obstructions to the proper healing of the body must be discovered and a way found for their removal, otherwise we will continually keep failing to cure our patients. Where we do not know the causes we can not hope to be able to always remove them. An accidental discovery may in some cases give us a method, but as a rule we must grope in the dark until the causes have been discovered. In the majority of such cases we leave the matter to nature and then take to ourselves the credit of

doing the work. We speak of some remedies as "almost specifics," because they succeed in a large proportion of cases and in a way that leaves no doubt of their efficiency. The writer believes that where such remedies fail other causes than the one thought responsible are at the bottom of the failure. If we knew how to overcome these unknown causes that lead to failure we would be successful every time. When we give quinin in malaria, mercury in syphilis and serums in their respective diseases their failure is due to the presence of causes that they were never intended to treat. All successful medication is preventive medication. Prophylaxis is the very soul of cure in every form of sickness. When we give quinin we kill the plasmodiums and prevent a new attack of the malaria. When we give diphtheria antitoxin we produce conditions unfavorable to the Klebs-Loeffler bacillus and so prevent a continued attack of the diphtheria. When we give a cathartic we force toxic substances out of the body and prevent auto-intoxication. When we can not get at the root of a disease we are content to attack and prevent the evil consequences likely to flow from some dangerous symptom. By thus being able to, as it were, lop off the tentacles of the disease we often cripple or destroy it as a dangerous enemy of the patient. Where sleeplessness is leading toward death, by the use of sulphonal or morphin we prevent this much of the disease from developing. We obviate the serious outcome. The deeper down our prophylactic measures can be carried among the bad symptoms the more likely are we to save our patients. To know how to prevent a tetanic spasm is not as good as to know how to antidote the poison of tetanus but it is well to be able to accomplish the lesser feat when for any reason we can not do the greater. There is no breach in continuity between sanitation and treatment. The aim and method of the one is the aim and method of the other. The method of each is summed up in the one word "prevent." To give drugs for any other purpose than the preventing of untoward effects is foolish. Beneficial symptoms should be let alone or encouraged. It is therefore important for the physician to be able to tell what symptoms of a disease are beneficial and what damaging. Grave blunders are committed by not knowing which to encourage, which to let alone and which to oppose.

The one important duty of the physician always is to fight or remove everything that he is sure is leading his patient toward a disastrous termination of the disease. He must at all times be on the alert for causes of evil and in their succession the deeper he can go the better will be his results in all kinds of cases. Skill in diagnosis is imperative, whether the inquiry relates to a baneful symptom or a specific cause. To give remedies that have been recommended for diphtheria, pneumonia, nephritis, mumps or measles because we have concluded that these are the ailments from which our patients suffer may by a sheer lucky hit be what they need, but the chances are very many against us in the matter. Superficial diagnosis, that knows no more about these diseases than is implied in the ability to give them these names, is wholly inadequate as an aid to proper treatment. Much more must be known, and the idea that disease is an entity, which our present nomenclature fosters, must be destroyed. An examination of the present trend of bacteriologic discovery will help us to a clearer conception of what is here meant and perhaps illuminate the subject in a number of important directions.

Let us for a moment consider the bearings of the fact that adaptation is a fundamental law of life. A study of the distribution of plants and animals throughout the globe shows us that the leading factor in placing them where we find them has been fitness. Water plants and water animals can not live in dry places while plants and animals able to live in dry places can not, as a rule, thrive well in wet places. The same is true for extremes of heat and cold, richness and poverty of soil, sunlight and shade, windiness and calm, with all other extremes of telluric conditions. Between the extremes of adaptation are all possible intermediate degrees. The range, too, of all plants and animals varies widely in extent in every environment. Some have a very wide range and others are restricted. What is true of the gross fauna and flora of the earth is equally true of the microscopic. The latter, like the former, develop vigorously where adapted, not at all where wholly unadapted and with intermediate degrees of vigor amid intermediate degrees of fitness. Microbes that are classed as non-pathogenic are such as are unable to spread to a damaging degree within the tissues of the body or such as are unable to produce poisonous substances within the body to its detriment. Pathogenic microbes produce poisonous substances or multiply within the body in a way that is injurious to it. They bear a similar relation to the body that weeds do to a garden. While there may be parts of the body that can resist their development, other parts are more favorable to them, permitting of their development. A given microbe may be able to develop in the lungs but not in the spleen. Another may find a favorable place of development in certain glands but be unable to multiply in the meninges. To some extent there is certainly reason to believe that most tissues have some degree of protection from some forms of disease germs. To hold, however, as many have done in the past and as some seem to do now, that but one kind of disease microbe is capable of developing in the kidneys, another in the brain, another in the spleen, another in the liver, another in the bones, another in the heart, another in the lungs, etc., seems extremely absurd.

The final settlement of the question regarding which microbes are capable of developing to a dangerous extent in the lungs and which in the liver or other organ must be arrived at by actual experiment. Analogy and probability seem now to lead to the conclusion that there are many pathogenic microbes capable of development in dangerous numbers in any one of all the tissues and organs of the body if they can only gain access to the same in any manner. It does not seem reasonable to think that nature should have given a monopoly of the lungs to some one kind of coccus, of Peyer's patches to a single kind of bacillus or of the liver or intestines to a single kind of spirillum. It is much more reasonable to believe that soil that will grow one kind of plant is likely to be able to grow many kinds. It would, indeed, be a singular plot of ground that, while containing many patches of differing soils, could only grow one solitary kind of plant on each kind of soil. Imagine if you can such a plot. In it the potato corner could grow neither peas, onions, weeds nor other plants, the pea patch could grow nothing but peas, and the onion region would be an inhospitable home for anything but onions. Is not such a supposition absurd on its face, and yet it is no more absurd

than the assumption that meningitis is due to but one kind of microbe which by diligent search is going to be discovered some day. Is it not much more reasonable to think that there are twenty or more kinds of germs capable of producing meningitis? To us it would not be at all surprising if future investigation should show that there are twenty or more kinds of pneumonia, hepatitis, meningitis, cystitis, enteritis, tonsillitis, carditis, gastritis, nephritis, etc. Is it not also quite reasonable to suppose that the cause of the pathologic condition in any one of these may be the cause in many of them? In other words, may not the nephritis of one patient have the same specific cause as the meningitis of another, the pneumonia of another and the carditis of another? If more than one kind can develop in the same region at the same time may not two or more kinds of microbes combine at various times to produce conditions of disease very like those produced by only one? Again, as microbes are known to have a sort of succession among themselves, may it not be possible that in some diseases the latter symptoms are due to a different set of germs from those at the beginning? All of these questions can only be finally answered by an appeal to nature.

Now let us inquire about the facts in the case as developed by bacteriologic investigation up to the present time. Dr. Kanthack, the pathologist of St. Bartholomew's Hospital, London, in Allbut's System of Medicine says that "undoubtedly the same morbid lesion may be produced by several different micro-organisms." "Strictly speaking, then, there is no specific organism of infective endocarditis; any one of a number of cocci may produce a disease, bacteriologically different from, but anatomically, pathologically and clinically identical with that produced by another member of the same group of organisms. Similarly, suppuration may be produced by any one of a large number of bacteria; and in the malady clinically recognized as erysipelas, instead of the streptococcus of erysipelas, other organisms may often be found. Septicemia and pyemia, again, may be produced by more than one kind of bacterium, and the same applies to pneumonia."[3] To these words there is no uncertain sound, although the author of them still clings to the belief that some kinds of germs are specific. It is always in regions of ignorance that old expiring notions take their final refuge. There are diseases of which we know little that may appear to possess the old quality known as specific and that we will have to consider such till we know more about them. Phthisis pulmonalis was at one time deemed a specific disease, but Koch's discovery of the tubercle bacillus showed it to be but a single form of tuberculosis. We now know that there is tuberculosis of the lungs, tuberculosis of the brain, tuberculosis of the skin, tuberculosis of the bones, and tuberculosis of almost every part of the body. If we consider the group of symptoms, including the lesions, as the disease then there can be no such specific disease as tuberculosis. It is only by claiming that the presence of the bacillus gives it a specific character that we are able to maintain such a position, but that would make every disease specific in a similar sense.

Dr. S. Flexner tells us that phthisis pulmonalis, or a disease with all of its symptoms, exists, in which there are no tubercle bacilli. In it we find a streptothrix instead.[4] Prof. Edgar M. Crookshank has pointed out that many of the lesions of actinomycosis and those of tuberculosis are alike.[5] Dr. Karowski of Berlin says the early stages of actinomycosis and of tuberculous phthisis require a bacteriologic examination to be sure of their difference.[6] Dr. A. Gouget reports a pseudo-tuberculosis of the spleen, liver, kidneys and other organs due to a streptobacillus and not to Koch's bacillus.[7] On the other hand, Dr. J. W. Moore tells us that the tubercle bacillus can cause pneumonia.[8] With this last-named, so-called disease we have abundant evidence to show that it has a multitude of causes. In the paper of Dr. Moore we learn that pneumonia is caused by the microbes of erysipelas, influenza, typhoid fever, tuberculosis, diphtheria and anthrax. Dr. Peter of Paris sustains this claim of there being an erysipelas of the lungs that we class as pneumonia.[9] Drs. Flexner and Anderson have also shown that diphtheria of the lungs is a pneumonia.[10] Wright and Stokes reported that in nineteen cases of bronchopneumonia the diphtheria bacillus was present.[11] Constanzo Zenoni reports cases of pneumonia due to a streptococcus.[12] Flügge gives Friedlander's bacillus as a common cause of pneumonia.[13] Dr. Moore gives evidence that typhoid fever of the lungs is pneumonia. He holds that in such cases the bacillus of Eberth gains entrance through the lungs as the initial lesion of the disease.[14] Whitelegge tells us that Friedlander's micrococcus, Fraenkel's diplococcus and Klein's bacillus have all been, on apparently conclusive evidence, established as causes of pneumonia.[15] Palamidessi of Florence reports cases of pneumonia from a micro-organism resembling those of fowl cholera and which was imported with parrots.[16]

It is apparent from the evidence now in our possession that typhoid fever is as protean in its forms as is tuberculosis or pneumonia. A number of cases have been studied that give evidence of the power of the typhoid germ to attack the body through various channels when there are no evidences of intestinal lesions. Dr. Keen reports cases of meningitis, pleurisy, goiter, hepatitis, pneumonia, and other affections occurring as sequels of typhoid fever, and others as occurring when there were no typhoid lesions in the intestines, but the typhoid germs were present in the organs affected.[17] An editorial note in the *Medical Press* reports five cases of typhoid infection without typhoid lesions.[18] Dr. Taty describes a case of melancholia with mental alienation of a double form due to typhoid germs.[19] Drs. Flexner and Harris describe experiments and cases of typhoid infection without typhoid lesions.[20] These authors also quote the evidence of DuCazal,[21] Kühnau,[22] Guinon,[23] Pick,[24] and especially Chiari and Krous,[25] as bearing in the same direction. Keen mentions the fact that pure typhoid cultures have been prepared from points of suppuration in many parts of the body.[26] The same author refers to cases of mumps as due to the typhoid infection[27] and of diseases of the bones as having the same cause.[28] Gasser describes a case of orchitis due to typhoid infection,[29] and Girode gives evidence of epididymitis having occurred from the same cause.[30] DuCazal and others have secured pure cultures of the typhoid bacillus from the spleen when there were no intestinal lesions.[31] In this connection it is interesting to learn that in a case of Dr. R. D. Mason's where the patient had swallowed some lemon seeds and they had sprouted in the intestines, the symptoms produced were like those of typhoid fever.[32] We thus learn that other things than the typhoid germs produce the

characteristic symptoms of typhoid fever, and that the typhoid germs sometimes produce symptoms not at all characteristic of typhoid fever as usually recognized.

If we turn next to as apparently specific a disease as gonorrhea, every physician knows the danger to the eyes of the newborn by infection with the coccus of this filthy affection, and now Dr. F. R. Hagner tells us that he has found cases of arthritis and tenosynovitis giving cultures of gonococcus.[33] In catarrhal conjunctivitis Dr. Gifford found that in an epidemic in Omaha, Neb., and surrounding country Fraenkel's pneumococcus was the cause, while in another in New York which he had had experience with a wholly different microbe was the cause.[34]

The discovery of the Klebs-Löffler bacillus and the study of its characteristics have within a short time completely altered our conceptions concerning diphtheria. Now there are cases, which a few years ago would not have been considered as even related to diphtheria, that are classed with that disease, and a number of anginal affections that we called diphtheria are now excluded from such recognition.[35] Dr. W. P. Herringham of St. Bartholomew's Hospital, London, says that "it must be remembered that membranes, produced by other bacteria besides the diphtheria bacilli, may appear in the throat, and that in many cases the clinical phenomena prove to be of but little assistance; a careful bacteriologic examination is therefore required."[36] Anders tells us that "diphtheria may exhibit a number of variations as regards the seat of attack and the severity of the poisoning." He mentions nasal diphtheria, wound diphtheria of lips, tongue, vulva or glans penis, laryngeal diphtheria, etc.[37] S. Gee refers to latent diphtheria, in which the poisoning occurs without the appearance of a membrane of any kind.[38]

Turning now to meningitis, we learn from the last report of the Massachusetts State Board of Health that in ten cases examined they found it due to the pneumococcus, in eight cases to streptococcus, in twelve cases to tubercle bacilli and in one case to anthrax.[39] Dr. J. A. Ormerod says that in some cases of purulent meningitis there has been found a micrococcus, in others the ordinary streptococcus pyogenes, and where the meningitis occurs "in connection with some acute infectious disease, such as typhoid, the organism proper to that disease."[40] If we next consider endocarditis we find the same state of affairs. Dr. Julius Dreschfeld, Professor of Medicine in Owens College, Victoria University, tells us that in most cases of this disease only one kind of organism was found in each case, but that they vary in kind for different cases. The organisms that have been found in this disease have been in some cases streptococcus pyogenes, in others streptococcus of erysipelas, in still others staphylococcus pyogenes aureus, and thus through different cases were found the pneumococcus of Fraenkel, the pneumobacillus of Friedlander, the typhoid bacillus, the bacillus of tuberculosis, the bacillus of diphtheria, the gonococcus, the bacillus endocarditis griseus, the micrococcus endocarditis rugatus, the bacillus endocarditis capsulatus, the bacillus immobilis et fœtidus, the bacillus of Gilbert and Lion, and a few other microbes with less definite character.[41]

Some of the names in this formidable list indicate the discoverer's idea that there was but one microbe of endocarditis. This antiquated notion is a vestige of demonology, which taught that every disease was an entity due to one simple cause, and that cause a demon or ghost obscessing the patient. The deeper we study the more clear the evidence becomes that no absolute specific character belongs to any disease. Many causes can produce symptoms in common, and as the sums of symptoms constitute the disease, we may expect to find no lines of demarcation in which disease does not merge with disease. There are specific causes for every diseased condition and the knowledge of these causes is what we need, to be able to treat them successfully. Dr. Stephen Mackenzie, in his presidential address in the Section of Medicine of the British Medical Association, at its Montreal meeting, expressed this idea in the following words: "Until the exact nature of disease is fully understood, a truly scientific treatment is manifestly impossible."[42] But now the question arises as to how we are going to reach an exact knowledge of diseases as long as we continue using a nomenclature that is a source of daily deception and misunderstanding? Nomenclature is the mental tool of every diagnosis. Imagine our trying to study botany without our present nomenclature. Professor Allbutt of the University of Cambridge in the introduction to his "System of Medicine" has, we are quite certain, made the one error of that ably edited set of volumes when he throws the weight of his great influence against the naming of diseases by a system of nomenclature analagous to that used in botany and zoölogy.[43] Does he propose to have us forever remain without names to indicate those "groups of certain degrees of constancy" among symptoms? If the grouping and exciting causes are united in a double or triple name all of Professor Allbutt's objections disappear at once. We are already drifting naturally toward it. We can not avoid it if we desire to. No man is strong enough to stay the current for very long. Any system of naming diseases by a single name will perpetuate the wholly false notion that a disease is a something like an entity. The single name and the demon notion were conceived together and will by association always suggest something of each other. A new system that would not only do away with that suggestive association, but that would also force the mind toward a knowledge of the congeries of symptoms would check the very tendency which Dr. Allbutt fears. In the names "typhoid pneumonia" and "tuberculous meningitis" we have already developed the germ of a truly scientific nomenclature. Let us agree to make the existing cause or causes, as soon as known, the generic name of the disease and the lesion or primary seat of the infection the specific name. As our knowledge grows more profound we will be able to group the causes into families if we desire to do so, but at present it is unnecessary.

It is a pity that our bacteriologists have not yet discovered the specific causes of such common diseases as measles, scarlet fever and smallpox. They should have been among the first properly named, but as it is they could only be named provisionally. As soon as we hear of diphtheria pneumonitis, typhoid pneumonitis, erysipelous pneumonitis, streptococcus pneumonitis, diplococcus pneumonitis, etc., we naturally form a mental image of an inflammation of the lungs due to the general cause which the generic title indicates.

With a pliable nomenclature such as this we can have not only diphtheria or diphtheritic pneumonitis,

but we can have diphtheritic meningitis, diphtheritic hepatitis, diphtheritic cystitis, diphtheritic nephritis, diphtheritic carditis, diphtheritic enteritis, etc. In the same manner we can have with typhoid pneumonitis all such combinations as typhoid meningitis, typhoid cystitis, typhoid enteritis, typhoid hepatitis, typhoid gastritis, typhoid carditis, typhoid nephritis, etc. Should we discover that in some form of typhoid infection the skin was the chief lesion, we would call it typhoid dermitis, and if the blood should be found the chief seat of the disease we could call it typhoid hemocytolysis. In case there is no particular localization of the damage, a general name could be supplied to express this idea, and where two, three or more distinct points of infection exist simultaneously this too could be expressed in a name. Where the specific microbe has a double or triple name these would have to be united and shortened, about as chemists shorten long organic chemic names. Amœba coli enteritis might be shortened into the name amcol enteritis. In this way the binominal system could be maintained for all ordinary affections and a trinominal kept for varieties. We already know that there are varieties of cholera answering to various kinds of spirilla and varieties of malarial affections due to different kinds of plasmodia. In such cases a triple naming would be a better means of telling the cause. As soon as such a system of naming diseases has become current it is but a short step to a corresponding system of analysis as applied to symptoms for the discovery of causes.

No effort has ever yet been made to classify symptoms in a scientific manner so as to aid the physician in making his inductions. As there is really but one disease, varying with the cause or causes and with the extent and location of the lesions, symptoms naturally arrange themselves in interblending groups. There are symptoms common to every disease, symptoms common to large groups of related diseases, symptoms common to small groups of diseases, and symptoms that belong to a single disease. Without a proper system of naming diseases their proper groupings is impossible. Correct the former and we can soon have the latter. With a proper nomenclature we can soon tabulate the symptoms as they appear. First we can find the most general ones that every form of disease manifests as soon as it has reached a certain degree of intensity. Next we can get a list of the symptoms common to the large groups, then to the small ones and finally to the single ones. The last-named symptoms, if correctly gathered, will tell the exciting cause, and when it is found, treatment is simplified to its utmost.

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POTASSIUM IODID IN CEREBRO-SPINAL MENINGITIS.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY H. A. MOODY M.D.

MOBILE, ALA.

The object of this brief paper is to emphasize the value of potassium iodid in meningitis, especially in that severe and fatal form known as cerebro-spinal meningitis.

Since deciding to present this subject I have looked through quite a number of the authorities most frequently consulted by the general practitioner, to form an approximate estimate of the appreciation in which this drug is held in the treatment of meningitis. I find that its use is recommended by many of them, but seldom during the stage in which I have found it most efficient. Biddle does not mention it in this connection; neither does Hare in his shorter work, the one most frequently consulted. Potter recommends a longer course of it during convalescence. Wood does not recommend it; neither does Stillé. Bartholow recommends it to remove adventitious products after the acute attack has subsided. Skinner reports Dr. Valten as asserting that it acts almost as a specific in epidemic cerebro-spinal meningitis. Flint says that symptoms of oppression call for potassium iodid. Von Ziemssen states that in a later period of the disease it is of great service. Osler merely remarks that iodid of potassium is warmly recommended by some authors. Aitken says, "no real proof of its utility has yet been brought forward." From the above it will be seen that we are not much encouraged to employ it by those authors most frequently consulted by the general practitioner.

Thirty years ago Tanner said: "With regard to medicines directly modifying the morbid action I know only of one in which the least reliance can be placed—the iodid of potassium." My own experience in the treatment of meningitis leads me to endorse the position of Dr. Tanner. I have witnessed two epidemics of cerebro-spinal meningitis, in the first of which the iodid was not used to any efficient extent, while in the second it was the principal element in the treatment.

In the first epidemic the treatment was purgation, morphin, chloral, the bromids, ergot, blistering and venesection. Nearly all the patients died; some in a few hours, others after many weeks of suffering. Venesection received the credit of saving a few lives, but as a rule both doctor and patient lacked the courage to employ it with sufficient boldness for efficiency. In the protracted cases the iodid was used to promote absorption, but seldom proved effectual.

Ten years later I was called to visit another community stricken with cerebro-spinal meningitis. To illustrate the violence of the epidemic, I will briefly relate its history. It originated in the home of a farmer whose house was a log cabin containing two rooms with an open passage-way between and a detached kitchen. It was built on low, damp, alluvial soil, and was much too close to the ground for the ventilation needed in southern climates. The family consisted of a man, his wife, and five children aged from 8 to 18 years. Water was procured from a well near the house, and the earth was so wet from spring rains that the water could be dipped out at the top of the well with a dipper made from a gourd. The man told me that before his family was attacked he noticed that some half-grown hogs running loose about the premises acted as though they were sick. He said that some of them "took fits and died."

His youngest boy, abut 10 years old, was taken with severe pain in his head, back and limbs. The physician who was called to attend him noticed a peculiar flea-bitten appearance on the wrists and chest. He suspected some eruptive disease, but the absence of any considerable rise of temperature puzzled him. The patient soon became comatose, and on the second day of his illness he died. Immediately after his death his mother was stricken and on the following day a brother and a sister developed the same symptoms. The physician became alarmed and sent for me to assist him.

I found the mother dead. The two living cases were suffering with severe pains in the head and back. Any touch upon the limbs provoked shooting pains; temperature but little over 100; pulse very soft and compressible, but regular and slow; there was a peculiarly soft, watery look of the eyes, as though there was lack of tension. There was a rose-colored eruption, thickest on the wrists and arms, but present in varying degrees all over the body. The spots varied in size from that of a pin-point to a fourth of an inch in diameter. They were evidently extravasations. Upon examining the body of the dead mother I found them much larger and darker than on the living, but the doctor informed me that until her death the spots had been rose-colored. I learned that in three other families living near by the same disease had appeared that morning. Each of these new cases occurred in persons who had spent a night or two in waiting on those first attacked. I visited all the cases, and could not doubt the existence of that most terrible of diseases, epidemic cerebro-spinal meningitis. Many kind-hearted neighbors had assembled to help the afflicted family, but when the dreaded name, "spotted fever," began to be whispered among them all left the place except some five or six men who deemed it their duty to bury the dead and remove the survivors from the infected locality. There was a general stampede from the neighborhood, and it is interesting to note that although the disease developed in some of the fugitives it was not communicated to those among whom they had come. Extreme caution, however, was exercised to prevent any unnecessary communication with those who had been exposed.

Remembering the unsatisfactory results of the treatment employed in my previous experience, I decided to give the iodid of potassium a thorough trial as recommended so highly by Tanner. The adults were given from 6 to 10 grains every two hours, children receiving proportionate doses. Pain was controlled by morphin hypodermically administered, and ergotin was also given. Each case had a cantharidal blister on the occiput and the back of the neck. Light was almost excluded, as a matter of comfort and protection to the eyes, and liquid nourishment was given in small quantities.

The number of cases thus treated under my observation was ten, and other cases which I did not see were similarly conducted. One of the early cases, far advanced before recognized, died. There was no further mortality; the disease seemed to yield visibly as the patients came under the influence of the iodid. Few of them recovered without some permanent injury. Several had the sight of one eye destroyed by suppurative choroiditis. Some lost their sense of hearing. In one case there was paralysis of a limb. I attribute the preservation of life to the iodid, because the ergot, morphin and blisters had utterly failed in my previous experience. During the subsidence of the epidemic another case died in a town six miles or more from the point where it originated. How the disease was contracted is unknown, as there was no traceable communication with infected persons or places. The nature of the case was not recognized by the physician for several days. The treatment was first calomel and then quinin, then morphin, chloral and bromids. I saw the case a few hours before death; there was no eruption, but otherwise the symptoms were well marked.

Since the experience above related I have tested the usefulness of potassium iodid in quite a number of cases of sporadic meningitis, and my confidence in its utility increases with experience. Quite recently I administered 50 grains a day for six days to a child 18 months old. Its father is a thoroughly equipped physician. He agrees with me that the iodid was the first medicine to exert any appreciable influence over the morbid process. The child recovered with the loss of its sense of hearing.

INFLUENCE OF AGE IN CAUSING OPACITY OF THE CRYSTALLINE LENS, AND THE PROPER USE OF THE WORD "CATARACT."

Presented to the Section on Ophthalmology, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY EDWARD JACKSON, A.M., M.D.

EMERITUS PROFESSOR OF DISEASES OF THE EYE IN THE PHILADELPHIA POLYCLINIC; FORMERLY SURGEON TO WILLS' EYE HOSPITAL, PHILADELPHIA, PA.

The subject of the pathology of cataract is too extensive to be profitably considered in the time at our disposal for the purpose; I shall, therefore, confine myself to one or two phases of the influences which determine opacity of the crystalline lens.

The common use of the phrase "senile cataract" argues a general consent in the view that advanced age has some fixed relation to the condition. That it can not be a necessary, or the only causative factor is demonstrated by the large number of young persons that we see with opacity of the crystalline lens, and by the other fact that many reach even an advanced age without suffering from such opacity.

Of recent years much attention has been directed to certain other probable or possible factors. Among these there can be little doubt but that eye-strain exerts an important influence. Many times where there had been recent impairment of vision, and upon

examination lens opacity found to be the cause of it, with the cessation of eye-strain the progress of the opacity has been absolutely checked. In a few, not only has the opacity ceased to increase, but there has been noticeable diminution of it. Such an occurrence is probably not very rare.

It has doubtless happened also to all of us to have encountered cases of lens opacity that have followed acute disease. The most striking cases of the sort that I have seen have been in connection with the grippe or epidemic influenza. In one of these cases three successive attacks of grippe in three different years were each followed by very rapid increase in lens opacity. After the first two there was slow improvement until the patient regained useful vision. The third attack left the vision reduced to the perception of moving objects, rendering extraction necessary.

With regard to renal disease as a cause of cataract, my experience would indicate that it was not very important. The routine of examination of the urine before cataract extraction has shown a comparatively small proportion of cases suffering from albuminuria, or showing casts. Angeiosclerosis usually attended with occasional traces of albumin in the urine is quite common among people old enough to be especially liable to cataract. And contrary to what I had before supposed, a recent examination of the history of a series of cataract cases has not seemed to support the view that albuminuria was especially frequent.

The matter of surprise to me was that this study of the subject showed such great frequency of lens opacity in advanced age. The statistics of an ophthalmologist's practice can not always be regarded as reflecting the frequency of certain conditions throughout the community; and yet, it seems to me, that even in that direction the following statistics have some significance, since a large proportion of the patients did not come for the opacity of the crystalline lens, but for other conditions, as acute or chronic conjunctivitis, or the fitting of glasses.

Among 10,000 patients attending my clinical services at the Philadelphia Polyclinic and the Wills' Eye Hospital, all of whom were examined ophthalmoscopically, except those in whom the use of the ophthalmoscope was impossible by reason of opaque media, or closure of the lids, there were 1544 over 50 years of age. Arranging these by five-year periods I find:

Age.	Lens clear.	Some lens opacity.	Totals.	Percentage of opacity.
50 to 55	460	81	541	15
55 to 60	260	50	310	16.1
60 to 65	196	85	281	30.2
65 to 70	99	83	182	45.6
70 to 75	60	71	131	54.2
Upward of 75	23	77	100	77
Totals	1098	449	1545	29

These figures, especially the percentages, strikingly point toward the importance of age in the production of cataract. Yet if we take an affection like toxic amblyopia, especially varieties caused by the abuse of tobacco and alcohol, and arrange the statistics in similar age periods up to the age of 60, the influence of age is quite as striking. Thus the age of twenty successive patients affected with toxic amblyopia, arranged in ten-year periods was as follows:

Under 30	none	in 4627
30 to 40	3	in 2116
40 to 50	8	in 1412
50 to 60	4	in 851
Above 60	5	in 696

Yet we hardly think of toxic amblyopia as due to age. So with senile cataract. While age is certainly a very important factor, it probably for many cases only constitutes a predisposing cause. Before the age of 50 cataract, aside from the result of traumatism, is rare; even at that age and for some years afterward, the cases giving a history of injury constitute a rather large proportion.

It has seemed to me that at this time eye-strain produces a decided effect in increasing the number of cases of lens opacity, since just before that age all patients suffer some strain from their loss of accommodation. The history of individual cases points still more strongly in this direction, many times it includes the rapid increase of the opacity during the period of severe strain from presbyopia, and after that the opacity becomes entirely stationary and remains so under proper supervision of the eyes for years.

Strain of the eyes from presbyopia is one way in which age may predispose to cataract. It is possible that later, in quite an opposite direction, the same influence may be exerted. The connection of cataract with choroidal disease and myopia is one of the few established points of its pathology. Now, the senile and the myopic eye have this in common: that there is less use of normal accommodation and whatever influence it may exert upon the nutrition of the eye is to that extent lost. It is certain that myopic and senile eyes show the same tendency to thinning of the choroid and loss of the retinal pigment layer, and it seems not unlikely that intermittent accommodation has some influence in maintaining the nutrition of the lens. There is besides these specific influences the general failure of nutrition that occurs in old age and it is not surprising that transparency, a highly specialized character, should be lost simply through the general lowering of nutritive activity.

But these statistics suggest another important thought. Of patients upward of 75 years of age, 77 per cent. show some opacity of the lens. Are all such patients to be informed that they are suffering from cataract?

Gould's Dictionary gives as the definition of cataract: "Diminished transparency or opacity of the crystalline lens, or of its capsule." This is substantially the definition given in other works of reference. But cataract, to the general public, means a disease of the eye leading to blindness, and only curable by a capital operation. So long as this condition was not discoverable until it had caused great impairment of vision and was perhaps approaching the proper period for operation, the discrepancy was not great. But now that we recognize the first beginnings of opacity in the crystalline lens, the use of the term "cataract" to indicate slight opacities, when it will be understood to mean early and complete blindness is seriously misleading. The introduction of the phrase "incipient cataract" is doubtless intended to meet this difficulty, but it does it very imperfectly, as must any phrase that retains the objectionable word. Many people have been rendered skeptics as to the honesty of the surgeon by a diagnosis of "cataract" which has not, after many years, been followed by blindness or any serious impairment of vision. Many have been rendered extremely unhappy by dread of blindness from which they were never likely to suffer. There has even been some confusion of thought in the profession upon the subject. I once

heard a surgeon announce in a State medical society that he favored operation on cataract in all cases when the vision fell to 20/70. I have known a surgeon of respectable antecedents to propose and urge such an operation for a patient who had some lens opacity but who could still see to do fine sewing and read ordinary type with either eye.

If the question of the significance of slight opacities of the lens were one rarely of practical importance, this subject might not be worth while discussing, but where it arises in more than three-fourths of our patients who have reached the age of 75 years it is of great practical importance. My own custom has been not to use the word "cataract" unless the opacity was causing serious impairment of vision, or likely to require operation. In the other cases I have informed the patient of the existence of "lens opacity," and have explained its probable significance, only speaking of "cataract" in response to some direct inquiry as to whether it or anything like it was present. I believe that such a course gives patients a far truer idea of their condition than one which calls all lens opacities "cataract." It seems likely that some such distinction of terms will in time arise. It is probably useless to attempt by recommendation or resolution to introduce such a term, but if the need for it is clearly recognized and appreciated on the part of the profession, the differentiation of language will naturally follow.

DISCUSSION.

Dr. F. C. HOTZ, Chicago—I am sorry that I came in too late to hear the paper and only caught the closing remarks, from which I infer that Dr. Jackson recommends the use of the term cataract only for rather advanced state of obscuration of the lens, so advanced that an operation will soon be necessary, and not to apply it to those slight opacities of the lens which may remain stationary for a great many years. So far as the patients are concerned, I fully agree with the reader of the paper, and just as he has been in the habit of not calling it a cataract when it is only a slight peripheral opacity, so have I restrained myself from using that term in conversation with patients. Certainly these opacities remain stationary for many years; for instance, I had this winter the opportunity to examine the eyes of a lady 69 years of age for a readjustment of her glasses, and she told me that thirty years ago she consulted Dr. Agnew in New York, who told her that she had a cataract in one eye. I was surprised at the information, because the vision in that eye was still $^{20}/_{40}$. At the examination in the dark room I found some short, equatorial streaks in the lens, so that evidently, if the information was correct, and I have no reason to doubt the lady's word, these equatorial streaks existed thirty years prior to my examination. As cataract is a condition which in the public mind is considered as a sign of advancing life, and as this lady after receiving the information from Dr. Agnew might have gone to some of these renowned healers, or to that institution in New York State that cures cataract by absorption, or if she had meddled with Christian scientists, who claim to stay the threatening blindness, she certainly would have had apparently good reason for giving credit to such healers for the fact that her eyesight had been preserved for thirty years. From such considerations I think it is a good suggestion on the part of Dr. Jackson that we should not use the term cataract for all conditions of opaqueness or disturbance of the lens transparency.

Dr. G. C. SAVAGE, Nashville—I should like to say a word relative to the causation of cataract. I think that one cause is a diminution of the nutrition of the lens because of failure of ciliary power. Whether we agree with Collins or not, that there are glands in the ciliary body which secrete fluid essential to the well-being of the lens, we must agree that the lens gets its nourishment largely from the ciliary body in some way. The more active the muscle of the ciliary body the better will be the nutrition of that body and the lens. I believe it is just as possible to develop a ciliary muscle which is weak, or to prevent its growing weak, as it is to develop any other muscle of the body, and it seems to me that the patient should be given the advantage that can be derived from restoration of the ciliary's power. I am approaching the age at which presbyopia usually comes; and more than a year ago I found it very difficult to extract foreign bodies from the cornea. I was beginning to hold my paper and book farther from me than was comfortable. I began then the exercise of my ciliary muscles and have now full restoration of power. I mention this to show you that the ciliary muscle can be developed and old sight be delayed, perhaps indefinitely. In this way may not the lens be made to retain its transparency as well as its elasticity for a long time? Thus we may be able to prevent the development of cataract. This exercise is effected by means of weak, concave, spherical lenses (—S. O. D.) in simple spectacle frames. For ten minutes each night I sit down, with the light turned low, and with the view of keeping my young sight and maintaining lens transparency, I exercise my ciliary muscles. I sit eight or ten feet from the light with my astigmatic glasses on; I raise and lower the exercise lenses at intervals of three seconds, for ten whole minutes. I can read without the use of old-sight glasses and I hope to be able to do so for years to come; and also hope to keep the nutrition of my lens so good as to prevent cataract.

Dr. LEARTUS CONNOR, Detroit—It occurs to me that if Dr. Savage's rule is correct, there need never be any increase in the inorganic matter in our tissues if we only exercise enough. It ought to be true of the biceps muscle as well as of the ciliary muscle. All should retain the proportion of organic matter that exists in youth. I should be very glad to think that my friend is right and that we have arrived at the basis of an elixir of life and need not die, for death comes from the increased proportion of inorganic matter in the several tissues of the body.

I think, though, that the doctor is right in one point: that is that the improved nutrition of the lens, however effected, is a feature in preventing the increase of these opacities. I have under my observation several persons in whom I recognized opacities in the lens, at times, varying from ten to eighteen years ago, who at that time had errors of refraction that were corrected, and the result of that correction has continued to the present time while the lens opacities scarcely changed. I think it was from Dr. Risley's paper, calling attention to the relation between the eye strain and the production of a cataract, that I got my suggestion on this point. At any rate it seems rational that if you can prevent abnormally disturbed nutrition you can retain its normal transparency. I think Dr. Risley at one time collected a vast amount of statistics in Philadelphia showing the proportion of cataracts as seen many years before and the slight change that had occurred. The result was that the greater attention to errors of refraction had diminished in Philadelphia the proportion of cataracts.

The only objection I see to Dr. Jackson's method, which I think is entirely sound, is that some other person may see the patient, tell him that he has a cataract, and the patient thinks the first examiner knew nothing about it. Perhaps that might be overcome by telling some of the patient's friends.

Dr. FRANK ALLPORT, Chicago—I suppose that a recitation of extreme cases in this particular might be valuable. We all see cases, from time to time, of opacities of one kind and another in the lens that do not increase from year to year, but Dr. Hotz's case reminds me of an instance, which I re-

ported in one of the journals, though I do not remember now just where.

A lady almost similarly situated came to me a year or two ago, and while under ordinary circumstances I would not have paid so much attention to what she said, I was forced to believe what she said because she was the wife of a physician and a woman of unusual powers of observation. She came for a correction of refractive error, and in the course of examination I noticed quite a considerable opacity at the periphery of the lens of both eyes. I spoke to her about it and she said that twenty-five or thirty years before she had been examined in New York, I think by both Drs. Agnew and Knapp, at least the former, and he told her to prepare herself for a cataract extraction in the course of a year or two. Her vision never decreased and she could see just as well at the time I saw her as she did twenty-five or thirty years before. This shows that we might allow these patients to retain their mental equipoise for a long time rather than disturb them with the information that they have a cataract, which is synonymous in their minds with the rapid approach of blindness.

I think we should tell them they have an opacity of the lens and not mention the word cataract, or else tell some of the friends of the family so as to protect ourselves. We all know that the correct adjustment of glasses and the building up of the health will put off the full development of the cataract in many instances for a number of years and it seems too bad to have sensitive patients disturbed for many years unless it is absolutely necessary to tell them.

Dr. JACKSON—I recall one case that is perhaps worth mentioning because it was seen by three or four prominent oculists. It was an old lady, then about 60 years of age, who had lost vision rapidly until she could not see to read at all. She had extensive lens opacity and it was expected that within a few months the cataract would be ready for extraction. All her eye work ceased. Pretty soon her vision began to improve somewhat, and it was found that it could be further improved by the aid of glasses, and in the course of a year or two she got back to reading. Now, after over twenty years, she reads magazines, newspapers, etc., for several hours a day and does not suffer from her impairment of vision. The condition is now one of almost entire opacity of the periphery of both lenses, with a small tunnel of clear lens substance right back of the pupil. It is not a peculiar form of opacity, but I think it might happen in almost any case of cataract that the progress of the opacity might be checked, or so far as we know, cease spontaneously. The point raised by Dr. Connor that the patient may be alarmed by somebody else and think we had overlooked the condition might occur, is an important one. I have discussed cataracts with my patients for the distinct purpose of preventing their being frightened by some one else. Where I have watched the lens for some months or years, where I knew the cataract was not progressive and where it was likely the patient might pass into other hands, I have gone out of my way to give the patient a full account of the condition of his eyes, to guard against that risk. I think this is just as important as it is to avoid the term cataract in many instances.

A FORM OF CORNEAL TURBIDITY EASILY OVERLOOKED.

Presented to the Section on Ophthalmology at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY H. GRADLE, M.D.,
CHICAGO.

The form of corneal cloudiness to which I wish to call your attention escapes detection when the eye is examined by either direct or ophthalmoscopic inspection. Apparently the cornea has its normal lustre and transparency. The turbidity is only detected on using a highly magnifying lens with lateral illumination. It is of course known that the normal cornea is a turbid medium. This can be shown strikingly when we use an electric light for focal illumination, and throw a sharp image of the incandescent filament upon the corneal surface. It seems to be less well known that the turbidity revealed by the focal illumination can be resolved by a strong lens into a granular appearance. There are differences in this respect between apparently normal eyes. The more turbid the cornea, the better defined the grain. I may add that by this method of examination other anomalies of corneal transparency may be found, which escape detection otherwise. A strong lens will reveal quite an amount of diffuse cloudiness around opacities, which, even with ordinary lateral illumination, seem well circumscribed. I have observed too, after some cataract extractions, that imperfect vision may be due to a corneal haze which I was unable to demonstrate by other modes of examination.

The form of corneal turbidity which is the object of this paper, appears simply as an exaggeration of the normal cloudiness. When both eyes are alike, it is difficult to say whether we observe the normal haze or a moderate exaggeration, unless the turbidity, and especially its granular nature, is very pronounced. If, however, the trouble is one-sided, the comparison between the two eyes proves decisive.

I have observed this corneal turbidity in patients complaining of asthenopic symptoms, with, however, more burning, smarting, or a feeling of "foreign body" than is usually mentioned in connection with refractive errors. The eyes become blood-shot on continued exertion. While the turbidity can not be seen with the ophthalmoscope, it still interferes with vision enough to lower it below the normal, even after the most painstaking correction of existing errors. It has seemed to be somewhat characteristic that these patients were uncertain in their answers regarding the influence of glasses, to an extent rather striking in view of the nearly perfect vision.

I will first quote the one-sided instances, as they are the most conclusive. Both the patients had bilateral errors, but complained essentially of the one eye. It was noticeable that the eye was irritated, as it presented a slight, but unmistakable inflammatory ptosis. There was no ciliary injection, but the deep scleral veins next to the upper and lower transition folds were prominently distended. On focal illumination and inspection through a short-focused lens, the cornea of the irritated eye presented distinctly more interstial haze and fine "dottings" than the other eye; otherwise the eye showed no anomaly that could account for the lowered vision.

Case 1.—Mrs. L., 53 years of age. Complained since many weeks that the left eye feels weak and gets tired on exertion, and ultimately begins to burn and becomes slightly blood-shot. She has changed her formerly satisfactory glasses to 3, 5 D, but without benefit. The right eye appears externally normal. The lid-aperture of the left eye is slightly smaller, and the left lids are a trifle more vascular than the right. On exposure the scleral veins next to the transition folds are visible in the left eye. The conjunctiva is normal, but everting it causes a trifling superficial injection on the eye-ball. Tension, pupils and fundus normal in both eyes. Lateral illumination and the use of the lens show an unmistakable difference in the turbidity of the two corneæ.

R.E. V $^{20}/_{100}$ Sph+1.5=$^{20}/_{25}$.

R.E. V $^{20}/_{100}$ Sph+1 & Cyl+1 axis 180=$^{20}/_{30}$.

Being somewhat uncertain how to interpret the condition

which I did not think was fully accounted for by the astigmatism, I advised rest of the eyes and the inspersion of calomel in the left eye. One week later the same objective appearances, but with comparative comfort except on use of the eyes. She was advised to use for work;

R.E. + 3, 5.

L.E. + 3, & Cyl. + 1 axis 180.

One week later she expressed herself satisfied, but the objective appearances were unchanged. One month later she admitted that she had even less discomfort in the left eye than at first when she began using her glasses. The objective difference between the two eyes still existed, but was less pronounced than originally. The calomel had been continued during this time.

Case 2.—Miss S., 35 years of age. Has noticed since years a small, faint spot of circumscribed redness on the external part of the sclera of left eye. Four years ago there appeared a "blister" on this spot which soon healed. On account of headaches, she received glasses (R. Cyl.—1, axis 180; L. Cyl.—1, 25 25 axis 180 & Sph.—0. 5), which gave her relief. The left eye has, however, remained smaller than the right, and is sometimes bloodshot. Lately she has had more or less burning pain in the left eye only. The right eye is externally normal, with the exception of slight distention of scleral veins next to the transition folds. The left lid aperture is smaller, the lids a trifle more vascular, the scleral veins at the periphery a trifle fuller than in the right eye. On the sclera of the left eye external to the cornea, there is a small, red spot made up of separate dilated vessels, but without any inflammatory appearance (hence, no episcleritis). The conjunctiva is slightly vascular in the superior transition folds in both eyes. Lateral illumination with magnification shows the left cornea decidedly more turbid and "dotted" than the right. The only ophthalmoscopic anomaly is a large conus downward in both eyes.

R.E. $^{20}/_{30}$ Cyl.—1, 25 axis 180=$^{20}/_{20}$—

L.E. $^{20}/_{40}$ Cyl.—1, 25 axis 165=$^{20}/_{30}$—

(With some uncertainty.)

Her glasses were changed, and one week later she expressed herself as nearly satisfied. She was ordered to insperse calomel. Eight months later she returned. She had lost all complaints after using calomel for a few weeks except the objective appearance, but since some weeks she has again more or less steady discomfort in the left eye, in the form of burning and scratching, increasing on exertion. The objective appearances are the same as the previous year except that the difference between the two eyes is not so pronounced. As far as one can judge in such subtle matters, there is less haze of the left cornea than previously, but a little more scleral vascularity on the right side. There is, however, still slight but unmistakable narrowing of the left lid aperture. She has now been under observation three months, and has nearly lost the objective appearances as well as the subjective discomfort; yet the treatment was hardly more than expectant. She has used calomel in both eyes, paid some attention to general hygienic measures, but has not abstained from moderate eye work. Although the left cornea seems to have cleared slightly, the vision has not improved, but her answers on refractive examination are more positive than formerly.

In the following cases the disease was not one-sided, but more pronounced in one eye than in the other. The cases are, therefore, not as clear as the two previous instances.

Case 3.—Mrs. K., 27 years of age. The eyes get tired on use, and exertion gives her dull frontal headache. Since three months she has a feeling of a foreign body in the left eye, which is sometimes bloodshot. The eyes and conjunctival surfaces are not reddened, but in the periphery the scleral veins are fuller than normal. The left eye appears a trifle smaller than the right. There is increased corneal haze apparently alike in both eyes—of course only visible by focal illumination. Fundus normal.

R.E. V=$^{20}/_{60}$. Cyl.—1 axis 90 & Sph.—.75=$^{20}/_{25}$.

L.E. V=$^{20}/_{90}$. Cyl.—1 axis 95 & Sph.—1.5=$^{20}/_{30}$.

She was ordered to wear Cyl.—1 and Sph.—0, 75, which proved most comfortable on trial. Twenty-two months later she returned, stating that the glasses had relieved the pain and headache, but for a while she still felt slight irritation in the left eye, and is probably not absolutely free from it yet. The objective condition is the same as previously. The left lid aperture a trifle smaller than the right.

Case 4.—Mrs. M., 29 years of age. Is in poor health since her last confinement; has pelvic disease. Since half a year she gets tired from eye work, which ultimately gives her a headache. The eyes are apt to become bloodshot, and the lids often droop so as to give her a sleepy appearance. The right eye is a trifle smaller than the left. The ophthalmoscope shows the edge of the right disc slightly blurred. The corneæ show both more than the normal turbidity.

R.E. V. $^{20}/_{40}$ Cyl.+0.5 axis 180 $^{20}/_{35}$.

L.E. V. $^{20}/_{40}$ Cyl.+0.5 axis 180 $^{20}/_{30}$.

She was ordered Cyl.+0.5 and the use of calomel as well as general hygienic measures, as I did not think that the local condition explained fully her complaints. However, two weeks later she admitted that she was much better, though still not able to use her eyes indefinitely without some suffering.

Case 5.—Miss S., 41 years of age. Had suffered much with headaches in the form of migrain, which two years ago were said to have been relieved by the use of a Cyl.+0, 5 axis 90. Lately she has again had more headache, probably from close application to study and want of exercise. On steady exertion she gets burning in the eyes. I found the refraction fully corrected by her glasses, though her sight did not reach quite $^{20}/_{20}$, especially in the left eye. Her accommodation was normal. I ordered only hygienic measures, which proved sufficient to give her relative comfort.

Six months later she returned, claiming to be fairly well satisfied, except that she still has burning of the eyes, lately somewhat more annoying. There is no injection whatsoever, but unmistakable increased turbidity of the corneæ, and in the left eye more than in the right. At the previous time she had not been examined in this respect. As her accommodation seemed slightly insufficient, she was advised to use Sph.+0.75 for a trial for work, but she has not reported the result.

Case 6.—Mrs. H., 57 years of age. Slightly tired on use of the eyes. Occasional migrain. Comes mainly on account of twitching of the left upper lid. The only anomaly found was a difference in the transparency of the two corneæ, the left being a trifle more hazy on focal illumination, and presenting a decidedly more marked—relatively coarse—grain.

R.E. V. $^{20}/_{40}$ Cyl.—0.5 axis 165=$^{20}/_{35}$.

L.E. V. $^{20}/_{50}$ Cyl.+1 axis 135=$^{20}/_{35}$.

Although she could decipher a little more positively with the left eye after correction than with the right, she was still definite in her statement that the letters seemed more blurred to the left eye than to the right. The above glasses given to her proved, however, satisfactory.

Case 7.—Mr. T., 20 years of age. Sight is blurred at times to a variable extent. Headaches from long use, and the eyes get red and watery, the watering being more annoying on the right side. He had lately obtained glasses (R.E. Cyl.—0,75 axis 180; L.E. Cyl.—0,25 axis 180 & Sph.—0,5), but was quite doubtful as to their value. I found his optic condition,

R.E. V. $^{20}/_{40}$ Sph.—0,5 & Cyl.—0,5 axis 90 $^{20}/_{35}$,

L.E. V. $^{20}/_{40}$ Sph.—0,5 & Cyl.—0,5 axis 90 $^{20}/_{35}$,

with considerable hesitation concerning these glasses. The corneæ were both decidedly turbid and almost stippled, so that there could be no doubt about its being a morbid condition, yet neither direct inspection nor ophthalmoscope showed this anomaly. There was slight congestion of the palpebral conjunctiva, but no actual catarrhal condition. The lachrymal puncta seemed normal on the left side, while on the right the lower one could not be found, and the upper one appeared unusually small. As I could not account for the watering, except on the supposition of a lachrymal stricture, I divided the right upper canaliculus down into the sac, finding indeed much obstruction in the path. In view of the corneal condition, I suggested calomel to be dusted in. Contrary to my expectation, the blurring and watering improved decidedly in the course of a fortnight. On using the probe a few consecutive times, the patency of the right passage was easily maintained. The left lachrymal channel was never examined. At the end of the third week he was contented to stop further treatment, as he was practically free from complaint, and his vision had risen to $^{20}/_{30}$. As far as one can judge, both corneæ appeared less turbid.

Four months later I found him free from discomfort, no more watering, vision satisfactory, though only $^{20}/_{30}$, and the cornea apparently not as turbid as originally. He accepted the same cylinders as before, but was doubtful about the concave spherical glass. He felt, however, no need for glasses.

All these patients had refractive anomalies, but these errors did not account fully for the complaints in the majority of instances, especially the one-sided ones. There was more burning and external irritation than is found in typic cases of refractive errors. While glasses were of benefit in all but the last instance, they did not give immediate and prompt relief to all symptoms. In the last instance, indeed, the complaint ceased even without optic correction.

Yet the refractive anomaly seems to me of some etiologic importance since the more ametropic eye showed the most irritation and the greater corneal turbidity in all anisometropic instances.

It was noticeable that these patients showed more than the ordinary hesitation in choosing glasses. In none could I obtain absolutely perfect vision. A condition of irritation was manifest in the one-sided instances, and in some of the unequal bilateral ones, by the slight but unmistakable ptosis. Indeed, it was this symptom which induced me to use lateral illumination, in the expectation that I might find a minute circumscribed corneal infiltrate as the possible lesion. Instead of this, however, there was the increased corneal turbidity entirely diffuse and not circumscribed. I do not consider this a keratitis, as there was neither dimness of lustre nor opacity recoggizable by the ophthalmoscope. Yet there must have been some irritative lesion, as suggested by the slight ptosis, as well as the fullness of the scleral veins next to the transition fold. The conjunctival congestion noticed in some was not always present, and hence was either secondary or irrelevant. As to the nature and exact site of the irritative process, I can not express an opinion. The corneal turbidity seems to me a secondary consequence, probably due to lymphstasis. It seems to account, however, for the imperfection of vision.

The irritative condition here described, is, I believe, a not infrequent bilateral occurrence, and, as such, a factor in many instances of rebellious asthenopia. But when bilateral the diaganosis is difficult. For the very symptoms which suggest it, the slight inflammatory ptosis, the vascularity of the sclera next to the fornix, are so little pronounced that they are scarcely observed unless unilateral and thus accentuated by comparison. The corneal turbidity itself is, as I emphasized, but an exaggeration of the normal condition. As the normal turbidity varies somewhat, the diagnostic judgment is easily at fault, unless the haze is relatively coarse or a difference between the two corneæ facilitates the comparison. The first bilateral case, however, that I observed not quite two years ago, showed such a marked turbidity and coarse "grain" that it could be easily and positively pronounced morbid; indeed, I hesitated whether or not to call it keratitis. Unfortunately I saw that patient only once, probably because the correction of her astigmatism proved relatively satisfactory. I have records of five other patients whom I would place in the same class. They all had more or less burning or smarting sensations not fully accounted for by their ametropia, as this was either minimal, or as its correction gave only partial relief. On using the eyes they became bloodshot. In all cases the vision was not quite equal to 20/20, and glasses, if accepted at all, were passed upon with much hesitation. In all these instances the corneæ seemed to me less than normally transparent. In some my diagnosis seemed definitely established; in others I remained in doubt on account of the feebly pronounced objective appearances. I can recall many instances besides that presumably belong to this group from my former experience before I used lateral illumination in such patients systematically, but of course lack the essential objective criterion in my records.

DISCUSSION.

Dr. L. J. LAUTENBACH, Philadelphia—I think any one who uses the ophthalmometer extensively will have noticed a large class of cases of opacity of the cornea not recognizable by the usual methods of examination. No ophthalmoscopic examination is equal to that which we get by taking the incandescent filament as our source of light, using its reflected lines to indicate the exact contour of the inside of the eyes as well as of the corneal layers. It is one of the best ways of carefully studying the corneal nutrition. The ophthalmoscope thus gives us knowledge not obtained in any other way. I simply mention this to call attention to the advantage of having the best instruments for bringing out the various fine anatomic and pathologic points.

The causation of these cases seems to me to reside in a disturbance mainly dependent upon blood conditions. These cases usually give a rheumatic or syphilitic history, though it is not always present. I expect in a very short time to bring forth a paper covering this very ground. It covers the case of a patient who was operated upon for cataract and where this peculiar opacity of the cornea has been greatly controlled by the use of glasses. In another similar case I am not using glasses, but with the knowledge of the man, am studying the changes that are taking place in his cornea.

Dr. EDWARD JACKSON, Denver—I have seen a few cases such as Dr. Gradle refers to, and I agree with him in thinking that eye strain is a very important factor in the causation. The condition has yielded to the persistent use of one of the slow mydriatics, used sometimes for three or four weeks.

Dr. HAROLD GIFFORD, Omaha—When Dr. Gradle announced the subject of his paper to me I thought it time to say something of a form of opacity which I have been demonstrating to my friends for some years. I have called them normal opacities of the cornea. I have never yet seen a cornea which with proper illumination and examination you could not dissolve the haziness into little spots and clouds distinct from one another. This is not easy to see and recently when I tried to demonstrate it to some gentlemen in New York, I failed entirely for want of a proper lens. The haze which you see with the ordinary pocket lens resolves itself when you get a magnifier of five or ten diameters into these little clouds. I think the explanation of that is that they represent the so-called corneal corpuscles and they are more prominent at times because of their filling up with leucocytes and that may account for the changes taking place under eye strain. I am sure that it is a perfectly normal condition and that any of you who take the proper means can demonstrate it to your satisfaction. If there is the slightest sort of irritation, be it an ulcer or foreign body, you will at once find these opacities much larger and tending decidedly to run into each other. They are more easily seen with a dilated pupil.

Dr. J. F. FULTON, St. Paul—I am very glad that Dr. Gradle has introduced this important subject, because it covers a class of cases that has embarrassed us very much. There is no doubt they are due to strain of some kind, and in many cases I think is a stage of active keratitis. This condition is not only due to refractive trouble, but frequently to muscular trouble, and anything that relieves the strain will improve the condition. It becomes therefore important not only to correct refractive errors, but to correct the muscular condition.

Dr. GRADLE—I mentioned the incandescent filament as a method of examination to show the normal turbidity, but it has no clinical advantage. I can confirm what Dr. Gifford said about the normal cornea. The haze can be resolved into fine dots or clouds and sometimes into a few comparatively coarse dots. It is difficult to say on examination of an eye whether the turbidity you find is more than normal or not. I can not do it except in one-sided instances or in those cases of bilateral trouble where the turbidity is decidly increased.

I consider this condition very common, for I have on record at least six cases since I began to observe the trouble two years ago, of the same condition existing in both eyes uniformly, but the

difficulty of diagnosis here is great. The cases are asthenopes that complain of external irritation of the eyes, sandy feeling, burning, etc. But the pronounced symptoms of the one-sided cases fail us in some of these bilateral cases. The first case I saw was so pronounced that I wondered whether or not it was keratitis. The other cases were not so pronounced, but in all there was sufficient turbidity to enable me to say that there was deviation from the normal.

BACTERIA ONE OF THE CHIEF ETIOLOGIC FACTORS IN DISEASES OF THE EYE.

Presented to the Section on Ophthalmology, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY ELLET ORRIN SISSON, M.D.

Professor of Anatomy and Director of the Microscopic and Bacteriologic Laboratories, College of Physicians and Surgeons, Keokuk, Iowa.

KEOKUK, IOWA.

While the relation of bacteria to general diseases has been proven beyond a doubt, and with the result that the practice of medicine and surgery has been practically revolutionized, and placed on a more thorough scientific basis than at any time in its history, the special field of ophthalmology has also received attention, and although we have but entered upon this line of research, we are able to report several important discoveries which are of inestimable value to the ophthalmologist, and which will undoubtedly be followed by others, serving to explain many hitherto misunderstood phenomena.

It is perfectly reasonable to suppose that bacteria should be one of the chief etiologic factors in the production of diseased conditions in the eye, when we take into consideration the exposed position of the organ. We have the moist surface of the conjunctiva presenting itself and furnishing an excellent lodging-place for all sorts of deleterious substances present in the air. It is rubbed by soiled fingers, washed with impure water from rivers, creeks and ponds, wiped with soiled towels, handkerchiefs, and whatever else comes to hand. Moreover, the slight alkalinity and small amount of proteid material contained in the normal secretions, as well as the fact that there are folds and crypts in the conjunctival membrane, favor the development of whatever germs accidentally enter. But aside from all these means of infection, an even more dangerous source of contamination is from the nose by way of the nasal duct and lachrymal sac, the continuity of the mucous membrane between these structures furnishing an excellent means of conveyance for saprophytic and parasitic (pathogenic) organisms from the nose to the eye and vice versa. Again, infection of the conjunctiva may occur from disease of neighboring bones and an inflammation of the sinuses, especially the maxillary sinus, or it may appear by the conveyance of micro-organisms to the conjunctiva through the blood- and lymph-vessels in cases of diseases of remote organs.

The various researches of Sattler, Michel, Fick, Weeks, Shongolowicz and many others, have clearly established the constant presence of numerous harmful as well as harmless bacteria upon the eye, and by this demonstration have shown a factor in prognosis which had not previously been considered.

Among the diseases in which the causative rôle is played by bacteria, we note first acute catarrhal conjunctivitis; that this condition is of microbic origin there can be no doubt. Gifford,[1] in an examination of forty cases of acute catarrhal conjunctivitis, ascertained the cause to be the pneumococcus of Fraenkel, which, according to the researches of Gasperini as reported at the Eleventh International Congress in Rome, is shown to be one of the most frequent microbes that inhabit the conjunctival sac. Gifford proved that the pneumococcus really caused the disease, by successful experiments in inoculating with pure cultures. According to Weeks, acute catarrhal conjunctivitis is caused almost exclusively by a small bacillus which he was the first to study thoroughly, and his observations have been confirmed to a large extent by Moran and Beach. In acute blenorrhea of the conjunctiva or purulent ophthalmia, the etiologic moment is the introduction into the conjunctival sac of some of the specific discharge from the urethra or vagina containing the gonococcus of Neisser. Kroner[2] examined ninety-two cases of ophthalmia neonatorum and found the gonococcus with "perfect ease" in sixty-three of them. In other cases it was difficult to find, but was successfully demonstrated. Dr. Th. Gelpke[3] recently, in a very interesting article, reports the results of a bacteriologic investigation carried on in conjunction with Professor Migula in an epidemic of acute purulent ophthalmia. After very careful observations they determined the cause to be the bacillus septatus. Koch and Gaffke found in a highly contagious conjunctivitis small rods resembling those of mouse septicemia, and Kartulas succeeded in growing the same on agar as fine, gray points, becoming confluent, making a stripe having a fatty appearance, which he considered as identical with the Leber-Kuschbert xerosis bacillus, but this Gelpke doubts after examinations of Leber's preparations. Schmidt found a form morphologically resembling the albus, and Parinaud one resembling the gonococcus, which Morax identifies as the streptococcus.

Another disease which, as we all know, is of bacterial origin, but which fortunately is rare, is diphtheritic conjunctivitis. Here, in the majority of cases, we have the disease extending by the avenue previously neglected, namely, from the nose by way of the nasal duct and lachrymal sac. Fuchs[4] says von Graefe observed many cases of diphtheritic conjunctivitis during epidemics of diphtheria in Germany, that "in lands where diphtheria prevails the disease appears, either sporadically or as an epidemic," that "at the time of an epidemic of diphtheria, other inflammations of the conjunctiva show a tendency to assume all at once a diphtheritic character." Fraenkel and Uhthoff have found that diphtheria bacilli are not uncommon in the conjunctival sac. Escherich reports two cases in which diphtheria bacilli were found in the exudate. In the same category as diphtheritic conjunctivitis comes tuberculosis of the conjunctiva caused by the bacillus tuberculosis of Koch. This condition is usually secondary to general tuberculosis, but Cheney of Boston reported a case before the American Ophthalmological Society, 1896, where the primary lesion appeared on the conjunctival surface of the left upper lid, and presented a typic appearance. Tubercle bacilli were found on microscopic examination. The glands in front of the ear were affected when first seen. Frequent examination of the chest failed to elicit any trouble in the lungs. Patient disappeared

[1] Archives of Ophthalmology, 1896.
[2] Bericht über Sitzungen der gynäkologischen Section der 57. Versammlung deutsche Natur-forscher und Aerzte zu Madgeburg, Vol. ii, 51.
[3] Graefe's Archiv für Ophthalmologie, xlii, 1896, p. 97.
[4] Fuchs: Lehrbuch der Augenheilkunde, S. 93, 1887.

from the clinic, May 26, and July 4, died of general tuberculosis. The main trouble just preceding her death seemed to be in the throat. E. Franke[5] reports a case where, in a seven-year-old boy of healthy parents, there appeared numerous blisters on the ocular conjunctiva, and little follicles in the retrotarsal fold of the lower lid, together with swelling of the preauricular gland of the right side. In a piece taken for examination there were giant cells and tubercle. A small portion of the excised conjunctiva was placed for experiment in the anterior chamber of a rabbit's eye; a tubercle of the iris formed in which bacilli were found. In the case of the boy, the entire diseased spot of the conjunctiva was removed, together with the pre-auricular gland. For a year afterward the boy remained without eye disease.

Bacteriologic research in connection with xerosis or xerophthalmos has resulted in the discovery of a bacillus which is believed by many investigators to be the cause of the disease. In the experiments conducted by Kuschbert and Neisser with this bacillus a moderate inflammatory reaction was obtained, while Leber describes a catarrhal condition of the conjunctiva which might be somewhat due to staphylococci present, and as previously mentioned, it has been confounded with the bacillus kartulis. In short, the descriptions of the xerosis bacillus are, in its morphologic and biologic relations, somewhat conflicting, so that only carefully conducted observations and experiments will succeed in establishing it as the microorganism of xerosis.

The first bacteriologic "arbeit" upon trachoma seems to have been done by Sattler,[6] who found small cocci of biscuit shape, joined in pairs but separated from each other by an intervening space, and in size and appearance much resembling the micrococcus gonorrheæ. This organism, described by Sattler, though it resembles the gonococcus, is certainly a different organism. Baumgarten and also Kartulis have taken exception to its specific action, by showing that it was absent in many cases of ordinary trachoma and in the cases of the virulent ophthalmia of Egypt. While in Egypt in 1882 and 1883, Koch[7] paid some attention to the ophthalmia prevalent there, and he reports that the cultivation experiments from the conjunctiva of these cases discovered the presence of the gonococcus and a tiny bacillus. Michel[8] found in numerous cases of Egyptian catarrh a diplococcus much resembling the gonococcus, but smaller. While both of these observers were in accord as to the shape and size of the organisms found by them, the latter alone was successful in his inoculations. Schmidt[9] differed again, and continually found in the secretions small, perfectly round, isolated cocci without a dividing septum, surrounded by a clear, gelatinous area, and resembling the staphylococcus pyogenes aureus. They occurred free and also in the protoplasm of the epithelial cells. In this connection let us point out that the morphology of the staphylococcus pyogenes aureus is now well known to be exactly that which Schmidt rejects. Schmidt found that the organisms which he observed readily induced trachoma in birds, which were very susceptible, but that mammals contracted the disease only after numerous repeated inoculations. His studies were thorough, comprising sixty-three cases, in forty-nine of which this coccus was found.

Kucharski[10] investigated twenty-six cases of trachoma and found numerous bacteria, among which were staphylococcus pyogenes aureus, bacillus subtilis, bacillus mesentericus vulgatus; when these accidental organisms were excluded, his cultures all showed one characteristic organism. This organism was a diplococcus of the size and shape of the gonococcus, possessed of a "springing movement." Sometimes it was seen to occur singly, sometimes in groups; sometimes short chains were observed, sometimes a figure B. The description of his coccus is thorough and excellent. Unfortunately, while it did not seem specific, he concluded to add it to the literature of trachoma. Goldschmidt's[11] coccus corresponds very closely to that of Michel.

Very remarkable results were obtained by Washejewski,[12] who studied thirty cases of trachoma in its various stages. He found single cocci and groups of cocci enclosed in the lymphoid cells, the red blood corpuscles and the epithelial cells. He was unable to find any other organisms. The cocci thus enclosed in the cells resembled the gonococcus.

Staderini[13] found a coccus much like the cocci already described. Its morphology was very similar to that of the gonococcus. Baumgarten investigated this organism and could not see that it differed from the staphylococcus pyogenes aureus.

Wittram[14] studied thirty-nine cases of trachoma and discovered cocci similar to those of previous authors, but as far as he could determine, inoculation experiments were all negative in their results.

Shongolowicz[15] introduced an interesting innovation in the etiology of trachoma by describing a specific bacillus which he found in seven out of numerous cases which he studied. Inoculations of pure cultures of this bacillus under the skin of two white mice, one guinea pig and one rabbit gave no results. Sixteen inoculations of pure cultures of the bacillus upon the conjunctiva of five rabbits, two dogs, four pigeons, one guinea pig, two white mice and two cats, were all productive, not of trachoma, but of a somewhat similar disease.

Alt,[16] in a paper read at the last meeting of the Western Ophthalmological and Oto-Laryngological Association, entitled "Recent Researches in the Histo-Pathology of Trachoma," reports as the result of his investigations, which have been very thorough, the finding of a parasite which he deems the cause of the disease. He found them in follicular conjunctivitis as well as in trachoma. From the similarity of the climatologic conditions under which malaria and trachoma seem best to thrive, Elze,[17] like many another before him, drew the conclusions, that the same or similar cause must bring about both these diseases. He observed, in one case, in the secretion, as well as in the granules, certain formations, which he thinks are monads, and which he especially likens to the

[5] Festschr. zur Feier des 80 Jahr. Stiftungsfestes des aerztl. Vereins zu Hamberg, Leipzig, 1896.
[6] Bericht über die xii. Versammlung der Ophthalmol. Gesellschaft, 1881.
[7] Wiener Med. Wochenschrift, 1883, p. 1550.
[8] Archiv f. Augenheilk., Bd. xvi, 1886.
[9] Dissert. St. Petersburg, 1887, Ueber die Mikroörganismen bei den Trachom und einigen anderen mykotischen Krankheiten der Bindehaut des Auges.
[10] Bakteriologisches über Trachom, Centralbl. f. Prakt. Augenheilkunde, 1887, xi, p. 225.
[11] Zur Aetiologie des Trachoms, Centralbl. f. Klin. Med., 1887, No. 18.
[12] Zur Aetiologie und Therapie des Trachoms, Wojenno-med. Shurnal, October, 1887.
[13] Richerche sulla, histologia e sulla patogenese de la conjunctivite trachomatosa, Annali di Ottalmologia, 1888.
[14] Bakteriologische Beiträge zur Aetiologie des Trachoms, Diss., Dorpat, 1889.
[15] St. Petersburger Med. Wochenschrift, 1890, N. F., Bd. vii, p. 247, Zur Frage vom dem Mikroörganismus des Trachoms.
[16] American Journal of Ophthalmology, Vol. xv, No. 4, p. 97.
[17] Berlin Gebr. Borntraeger, 1897.

trichomonas batrachorum, and proposes to call plasmodia.

Thus the bacteriology of trachoma is of special interest, and, while the majority are inclined to the opinion that at the present moment we have no reason for regarding any bacteria as specific for trachoma, still no one will deny that the bacteriologic researches in connection with the disease have been productive of much good, as everything points to its being a germ disease, and as we have seen, there seems to be a pretty well established connection between trachoma and gonorrhea, and it is not improbable that the rôle played by the gonococcus is of more importance in the etiology of trachoma than is generally supposed.

Passing to diseases of the cornea, careful observation and study go to prove that many corneal troubles are dependent directly or indirectly upon invading bacteria. Leber has shown how serious may be the results of a growth of comparatively harmless organisms if once they secure a footing in the proper soil, and reason exists why we should believe that keratitis may result from ordinarily harmless bacteria should they gain entrance to the corneal layers. Babes obtained from the broken-down corneal tissues and from various organs of a child who died of septicemia following keratomalacia, a bacillus which he terms the bacillus septicus keratomalaciæ. Cultures of this bacillus inoculated into the cornea caused purulent keratitis.

The capsule bacillus of Loeb was also obtained from a case of keratomalacia infantum by inoculating media with a little of the softened exudate of the cornea. It resembled the bacillus capsulatus of Pfeifer, but is said to be somewhat larger and thicker than the latter.

Experiments with the bacillus of Fick,[18] which has been found in the conjunctival sac, showed that when inoculated into the corneal tissue the organism produced a distinct keratitis, and sometimes caused a perforating ulcer, which required about four weeks to penetrate the corneal tissues. The work in this field has but just commenced, and bacteriologic research will undoubtedly reveal much which will be of value in connection with corneal diseases.

There is one more disease which I must consider before closing this paper, first because of its importance, and second because it is recognized by all authorities to be directly produced by bacteria. I refer to sympathetic ophthalmitis. This affection, as we know, owes its name to the theory, held until a few years ago, that it was due to reflex action of the ciliary nerves. Investigations made in recent years[19] have placed it beyond doubt, that sympathetic ophthalmitis is an inflammation propagated to the sympathizing eye by direct continuity through the optic nerves and chiasm from the exciting eye, as erysipelas extends over the skin, and that the staphylococcus pyogenes albus or aureus is the active element in the process.

Time will not permit a further discussion of this interesting subject, and as I have repeatedly said throughout this paper, the work has but just commenced, and in view of the fact that besides the bacteria occurring in connection with the diseases mentioned, and which we have no right to deny is the direct cause of them, we have to deal with such bacteria as the bacillus coli communis, bacillus influenzæ, bacillus lepræ, bacillus of measles, bacillus pyocyaneus, bacillus syphilis, staphylococcus, pyogenes citreus and streptococcus pyogenes, some of which have been demonstrated as occurring in the conjunctival sac and we have no reason to believe that the others do not; I think we are perfectly justified in believing that bacteria are one of the chief etiologic factors in diseases of the eye.

[18] Ueber Mikroörganisms in Conjunctival Sac, 1887.

[19] Knies: Sitzungsber d. Ophth. Gesellsch., 1879, p. 52; Leber: A. v. Graefe's Archiv, xxvii, pt. 1, p. 325; Bailey: Trans. Internat. Med. Congress, 1881, Vol. iii; Snellen: Trans. Internat. Med. Congress, 1881, vol. iii; MacGillivray: Amsterdam Internat. Med. Congress, 1879; Berlin, Volkmann's Samml. Klin. Vorträge, No. 185, 1880; Deutschmann; A. v. Graefe's Archiv, xxx, pt. 3, p. 77, xxxi, pt. 2, p. 277, and Ueber die Ophthalmia Migratoria, 1889; Gifford; Archives of Ophthalmology, 1886, p. 281. Randolph, in Arch. of Ophthal., Vol. xvii, p. 188, does not support the theory of extension of the process through the optic nerves and chiasma, but he does not offer an alternative explanation.

CONCLUSIONS FROM CLINICAL AND BACTERIOLOGIC EXPERIMENTS WITH HOLOCAIN.

Presented to the Section on Ophthalmology, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo, June 7-10, 1898.

BY ROBERT L. RANDOLPH, M.D.

BALTIMORE, MD.

I have been using holocain for some months and have recorded here fifty cases where it was recently employed in the eye clinic of the Johns Hopkins Hospital. Seventeen of these cases were foreign bodies in the cornea, and the average time employed to produce anesthesia was a little less than two minutes. In three cases iridectomy was performed and in four cases cataract extraction. Here I made the same number of instillations as I do when employing cocain, that is three in fifteen minutes, and all that can be said is that I noticed no difference in the anesthesia from that produced by cocain, and the same may be said of eight tenotomies. The other cases were where the holocain was used after the application of silver nitrate, after the passing of probes, in operations for tarsal cysts and pterygia. With the exception of the tarsal cysts the anesthesia was produced in a little more than two minutes. Most of those who have reported on the subject of holocain have alluded to its germicidal properties. I have looked through the literature, and with the exception of some very meager experiments made by Heinz, showing that the yeast bacteria are retarded in their growth by contact with holocain, have found no record of experiments proving that a solution of holocain is a germicidal one. The following experiments were made to throw some light upon this aspect of the question:

1. *To determine the effect of a 1 per cent. solution of holocain upon the micrococcus epidermidis albus.* (Welch.) For this purpose thirty wooden toothpicks were sterilized by boiling for ten minutes. They were then immersed for five minutes in a suspension of the organisms in sterilized water, afterward taken out and dropped into a 1 per cent. solution of holocain. Here they were allowed to remain fifteen minutes. They were then taken out with long sterilized forceps and plunged each into a tube containing nutrient agar. After being in the thermostat twenty-four hours they were inspected, and in every tube there was a luxuriant growth. Control tubes showed that the pieces of wood were sterile before immersion in the suspension of organisms. The growth in half of the tubes was examined and the micrococcus epidermidis albus was found in every instance. Fifteen

experiments made with the staphylococcus pyogenes aureus resulted in the same manner. In another series glass rods were employed instead of pieces of wood. They were sterilized in the flame. They were then dropped into a suspension of the aureus in sterilized water and allowed to remain there five minutes. When taken out, instead of putting them directly into the holocain solution as was done in the first and second series, they were put into a sterile tube and allowed to dry thoroughly and then immersed fifteen minutes in a 1 per cent. solution of holocain, after which each rod was plunged into a tube of nutrient agar. The result was the same as in the first and second series.

2. *To determine whether a 1 per cent solution of holocain has an inhibitory effect upon these same organisms.* Five grains of holocain were dissolved by boiling in two drams of water, and to this were added six drams of fluid agar. The resulting mixture was practically a 1 per cent. solution of holocain. Twenty tubes of "slant agar" were prepared in this way and ten "smear cultures" made of the staphylococcus pyogenes aureus and ten of the micrococcus epidermidis albus. These tubes were inspected every day for three days but there was never any evidence of a growth. This experiment was repeated a number of times by others in the laboratory as a control measure, and in every instance with the same result. Neither the staphylococcus pyogenes aureus nor the micrococcus epidermidis albus would growin a medium containing holocain in the proportion mentioned. It may be said that a solution of holocain half the strength employed in these experiments does not inhibit these organizations. The positive results of the experiments to determine whether holocain had an inhibitory effect upon the organisms would seem to indicate that some of the organs on the glass rods and pieces of wood in the first, second and third series were killed. To determine this question the following experiments were made:

A thick suspension of the staphylococcus pyogenes albus was made in physiologic salt solution. Five loops of this suspension were transferred to a tube containing two drams of a 1 per cent. solution of holocain, and five loops were transferred to a tube containing the same quantity of salt solution, the latter as a control measure. After allowing the organisms which had been transferred to the holocain to remain there five minutes, two loops of the latter solution were carried into fluid agar and plate cultures made. This was repeated after ten, fifteen, twenty and thirty-five minutes, and finally, after twenty-four hours. In the first plate (after five minutes) there were fifteen colonies; in the second plate (after ten minutes) there were about the same number; in the third plate (after fifteen minutes) there were five colonies; after twenty minutes three colonies; after thirty-five minutes two colonies, and finally, after twenty-four hours, the plate was sterile. This series was repeated and with practically the same result. There was a gradual diminution in the number of the colonies, the longer the organisms were allowed to remain in the holocain, and after twenty-four hours it was seen that the holocain no longer contained living organisms. Plate cultures made after twenty-four hours from the salt solution showed numerous colonies.

Conclusions:—Holocain, in so far as its anesthetic properties are concerned, seemed in these fifty cases to have been sufficiently effective. In those cases where a test was made of the rapditiy of its action, as for instance, in foreign bodies in the cornea, in pterygia, and after the application of irritating substances the quickness with which anesthesia was produced was striking. Whether the anesthesia produced after two minutes is sufficiently profound to guarantee a painless iridectomy or a satisfactory cataract extraction I did not determine, but in those cases where operations of this character were performed, and where the holocain was instilled just as we do cocoain, no difference was observed in the anesthesia from that produced by cocain. The drying of the cornea and dessication of its epithelium, the dilatation of the pupil, the absence of which phenomena has been noted by others has been confirmed by my own observations. The absence of these two properties should recommend it for office use for the removal of foreign bodies, as it is well known that after the employment of cocain in such cases blurred vision and slight photophobia are often present for hours.

A 1 per cent. solution of holocain has not only an inhibitory effect upon the pus organisms, but these organisms are killed when exposed to a solution of this strength for a certain length of time. No attempt was made to determine the point of time at which these organisms lose their vitality on exposure to holocain, but it may be safely said that this point is somewhere within twenty-four hours. Furthermore, exposure to a 1 per cent. solution of holocain for periods of five, ten, fifteen, twenty-five and thirty-five minutes showed in every instance a gradually diminishing number of colonies in the plates, so that it is plain in spite of the luxuriant growth around the glass rods and pieces of wood many of the organisms were killed. It may be said in conclusion then, that a solution of holocain of the strength employed in ophthalmic practice possesses distinct germicidal properties, a fact which it is evident enhances the value of this product.

DISCUSSION.

Dr. H. V. WÜRDEMANN, Milwaukee—I have been unable to make any experiments regarding the antiseptic properties of holocain solutions, but as far as my experience goes I should say its solutions are stable and antiseptic. A solution which I had and kept for the purpose of seeing whether it remained aseptic, though opened from time to time during eight months, shows that the solution remains clear and that it is antiseptic. I am pleased at the exhaustive character of Dr. Randolph's paper, for it seems to prove the claims that Tauber, Heintz and I have made.

As regards its clinical aspects I have had much experience having used it as a local anesthetic in almost all of my bulb operations during the last year. I have done several hundred operations with holocain, from corneal and conjunctival to cataract operations. I have found it similar in effect to cocain but it has several advantages. It more thoroughly anesthetizes the deeper structures, and its effect is more lasting. It does not affect the accommodation, the pupil or the tension. It is quicker in action, and does not affect the epithelium of the cornea. That is a most important point; one can anesthetize an eye for a half hour or an hour, leaving it exposed to the air, but keeping it moist from time to time, and will not find any erosion of the epithelium. We use less of the drug than of cocain, the percentage of the solution being only 1 per cent., and it is hence proportionately cheaper.

As a disadvantage, it is said that it is more poisonous than cocain. I have not had any ill effects from its use on the eye, nose or fauces, but I have not used it hypodermically. The bleeding is more free than under cocain, and it is not so good for muscle operations. It is slightly more irritating, and I

have had patients complain after the removal of a foreign body that the sensation remained for some time, which is not the case after the use of cocain. Another disadvantage to those of us who boil our instruments in soda solution is, that it is necessary to wash the instruments in sterilized water, because the soda is precipitated and the solution becomes turbid.

I should say, from my experience with it in about fifteen cataracts, seven iridectomies, four operations for glaucoma and a number of minor operations, that this drug is a most satisfactory local anesthetic, and I recommend it especially for office work.

Dr. E. C. ELLETT, Memphis—I have had a little experience with holocain during the past winter, limited to its use in removing foreign bodies from the cornea and conjunctiva, and with cataract extractions associated with iridectomy. I have done seven or eight cataract extractions in that time with holocain, all with iridectomy except one, which was iridectomized the next morning on account of prolapse. Holocain seems to me to be a more satisfactory anesthetic than cocain, and I think the first drop often does not produce as much irritation as the first drop of cocain. The fact that it does not influence the pupil or corneal epithelium is an advantage.

Another class of cases in which I have used it are those small but painful corneal abrasions, the type in which the cornea of the woman is wounded by the nail of the nursing child, and we know how painful they are. Knowing that holocain has no effect upon the corneal epithelium, and that it has a germicidal action we feel no hesitancy in putting it into the hands of patients for as liberal use as they may require.

I have noticed two things which I do not know whether to attribute to the drug or to my preparation of it. One is that after standing for some time the solutions acquire a delicate pink color, not so deep as eserin, but a faint pink. It may be that this is due to some action of the holocain on the glass bottle in which it is preserved. The other point is that in one case of cataract extraction the solution which I had used repeatedly did not produce anesthesia. Not being able to get a fresh solution at once, I had to use cocain. I later operated upon the other eye of that patient with holocain, and with satisfaction.

People frequently come to the occulist with a foreign body and ask me to "take this out without cocain if you can, because it dilates the pupil so I can not work the rest of the day." It becomes a satisfaction then to have such an anesthetic as holocain.

Dr. C. D. WESCOTT, Chicago—I have been using holocain solutions for six months, and have two observations to make that may be of interest in this connection. To test the rapidity of the anesthetic action of a 2 per cent. holocain solution I used it in an extraction. After cleansing the eye I applied one drop on the cornea, waited one minute and gave another, in one more minute applied a third and immediately made my section without any sensation to the patient. After completing the section I applied another drop, waited perhaps forty seconds and did the irridectomy without the slightest evidence of pain.

I am inclined to think, however, from another experience that holocain is not absolutely without deleterious effect upon the epithelium. In a nervous, hysterical woman, where I was obliged to do a very tedious advancement, the tendon having retracted very far, I used a 1 per cent. holocain solution. The eye was exposed for thirty minutes, and although I applied boracic acid solution repeatedly, when I came to take out the speculum I noticed a positive blur of the corneal epithelium. The diameter of this spot was at least 2 mm., and touching it very gently with a smooth instrument, I demonstrated beyond doubt that it was separated from the substance of the cornea. I cleansed the eye, bandaged it and no harm resulted. I operated upon the other eye of the same patient two or three weeks later, using 5 per cent. cocain solution, without any deleterious effect upon the epithelium, but the eye was not exposed more than fifteen minutes in that operation.

Dr. F. C. HOTZ, Chicago—We are indebted to Dr. Randolph for having conclusively demonstrated by experiment that a solution of holocain is and remains sterile for an indefinite time. It is certainly a most valuable local anesthetic. It is the ideal local anesthetic for removing foreign bodies, and to have such a remedy that we can at a moment's notice use, with the knowledge that it will not carry infectious germs into the eye, is of great value. It has been stated so frequently that I need not now go over my experience, to bring out all the points about holocain. One point, however, that should be mentioned is this, that it irritates more than cocain and in fact increases the congestion of the eye, and on that account I have noticed that in muscle operations there is more hemorrhage than after the use of cocain. To obviate this bleeding, I have first used cocain to produce anesthesia and then kept it up by means of holocain; for I find that it will keep up a continuous anesthesia for any length of time needed, if instillations be repeated about every five minutes.

Dr. FRANK ALLPORT, Chicago—I would like to ask Dr. Randolph if the holocain solution can be boiled without any injury to its efficiency?

Dr. RANDOLPH—Yes sir.

Dr. H. M. STARKEY, Chicago—I am sorry we have not had a little more discussion of the first paper, which is certainly a valuable contribution to the subject. I think, as we make more careful examinations of the cases that come before us with regard to their bacterial infection, we shall be able to classify them in a more scientific manner. The attention of the section is called to a ready means of obtaining pus from patients that we see outside of our office. It used to happen to me frequently to be called to see a case of purulent conjunctivitis or other infection at the patient's house, whence I had no means of taking secretion back to the laboratory, and perhaps on making another visit the conditions were found to be so changed that it was useless to take the specimen. It is now my custom to have a few cover glasses constantly in my pocket. I carry these in a very small tin ointment box and also have another box of the same size in which to carry the infected covers to the laboratory. In this way a small drop of secretion may be easily and safely carried between two covers.

Dr. R. L. RANDOLPH, Baltimore—I have been very much interested in what has been said by those who have used holocain, particularly in Dr. Ellett's remarks. We meet with cases in which cocain acts in the same way and where a general anesthetic is called for. It is of great value to know that this agent possesses properties that are not only antagonistic to the growth of organisms, but that they can not live in it, for it actually kills these organisms.

FIVE CASES OF CONGENITAL, BILATERAL, SYMMETRICAL DISPLACEMENT OF THE LENS OF THE EYE IN THREE SUCCESSIVE GENERATIONS OF ONE FAMILY.

Presented to the Section on Ophthalmology, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

EDWARD FROST PARKER, M.D.
CHARLESTON, S. C.

Cases of congenital ectopia lentis may, for convenience of reference, be divided into three groups: first, those occurring in one member of the family; second, those occurring in several members of the same family; and third, those occurring in one or more members of a family for two or more generations.

The malformation is not commonly met with, as out of fifty thousand hospital and private patients of Knapp's in New York City, only ten (1 in 5000) were seen. Notwithstanding this, however, illustrations of individual cases (group I) are quite numerous in literature, and probably number about a hundred.

Examples of the malposition occurring in more than one member of the same generation of a family (group II) are also on record to the number of twenty. Instances of the ectopia in several members of the same family for several successive generations (group III) are quite rare and far more interesting, and merit reporting from this standpoint no less than from the fact that they show in a remarkable manner the marvelous and fateful power of hereditary influence in the transmission of physical defects, as well as disease.

A complete record of all such instances I am enabled to report below, through the courtesy of Dr. David De Beck of Cincinnati, a recognized authority on congenital anomalies, to whom I am much indebted.

D'Oench [1] in 1881, presented some valuable conclusions as to the nature, history, symptoms, etc., of congenital ectopia lentis, drawn from the collated statistics of most of the hitherto published cases, belonging to the three groups I have mentioned. He relates that the first cases of luxation of the lens recorded were reported by Sichel in 1846, but that these were no doubt spontaneous, Sippell [2] in 1859, being the first to draw the distinction between congenital and spontaneous luxation, illustrating the same by reporting the condition in his own, his mother's and his brother's eyes. The influence of heredity was quickly recognized, though the exact cause remained for some time a subject for theory.

Lang and Collins [3] assert that it is "due to some defect in the development of the suspensory ligament, caused by a failure or late closure of the ocular cleft in the ciliary region, so that as the eye expands there is no suspensory ligament to hold the lens down in that region, and it consequently becomes drawn in the opposite direction."

Five cases of bilateral, symmetrical, congenital dislocation of the lens occurring in three successive generations of one family recently having come under my observation, I have endeavored to present their salient features in brief detail, and at the same time to collect the history of all similar cases.

The following are my own cases:

Mrs. H., Columbia, S. C., aged 67, consulted me Aug. 12, 1896, and claimed to have had defective sight from her earliest childhood. Her vision, however, in spite of great difficulty in getting glasses to suit her, had been useful until recently, when it had become smoky. The eyes of her parents were normal as far as she knew. She had six children, only four living. By means of either focal illumination or the ophthalmoscope the dislocation of the lens could easily be detected, in the right eye almost exactly, but only slightly upward. The right lens was completely, and the left partially opaque. With the instillation of homatropin nothing further was observed, no threads or suspensory ligament folds being found. Gray tremulous irides. Patient could read with R. E. $\frac{3}{200}$ + 8 D. Sph. = $\frac{15}{30}$. J. 14 at 5 inch + 16 D. Sph. = No 9. With L. E. $\frac{3}{200}$ no glass improves. J — 14 at 5 inches no glass improves.

Raab [4] asserts that congenital ectopia is one of the most frequent causes of spontaneous luxation, and D'Oench corroborates this by stating that the number of cases in which both congenital and spontaneous luxation have been observed make it almost certain that the latter is a frequent result of the former. I judge therefore that the luxation of the right eye was at first up and and out, but that the same changes which caused it subsequently to become opaque caused it to change its position. In addition downward luxations are rare and unknown. She received convex glasses and was dismissed.

Mrs. A. W., of Charleston, S. C., aged 35, a daughter of Mrs. H. was seen Nov. 8, 1897. Mrs. W. is very myopic, and wears glasses. She has three children, two boys, one girl.

Vision in R. E. $\frac{15}{40}$ not tested with glasses. J — 1 at 6 inches. L. E. $\frac{3}{200}$ not tested with glasses. J. — 5 at 2 inches. Brown tremulous irides, upward dislocation of both lenses.

Albert W., aged 15. Brown tremulous irides. Vision R. E. $\frac{2}{200}$ not tested with glasses. J. — 7 at 1 inch. Left eye $\frac{15}{200}$ not tested with glasses. J — 1 at 6 inches. Dislocation of both lenses upward and outward.

Theodore W., aged 12. Brown tremulous irides. Vision R. E. $\frac{15}{30}$. J. — 1 at 6 inches. Does not wear glasses Vision L. E. $\frac{15}{30}$. J. — 1 at 6 inches. Slight upward dislocation of both lenses.

Mary W., aged 8. Brown tremulous irides. Upward dislocation of both lenses. Vision R. E. $\frac{3}{200}$. J. — 5 at 1 inch. L. E. $\frac{2}{200}$. J. — 5 at 1 inch. No glass improves.

D'Oench thinks that in those cases where no glasses improve the vision it is due, perhaps, to a "torpor of the retina, caused by indistinctness and interference of the images."

The indisposition of the patients to submit to any prolonged examination prevents more exact observations as to the proper corrections of the errors of refraction.

In all the cases, the irides were tremulous, the anterior chamber appeared deepened in that part unsupported by the lens, the lenses were clear, except in the case of Mrs. H. Their size was normal, the suspensory ligament was not observed, the direction of displacement was as stated, upward, and upward and outward, the intelligence was of a high order, the vision varied with a degree of luxation, the tension, the cornea, as well as the shape and size of the globe and the fundus and disc even were all normal; no diplopia was complained of and there was no corectopia, irideremia, mystagmus, coloboma, detached retina or strabismus observed, the dilatation of the pupil in the two cases in which a mydriatic was used appeared normal.

The following is a resumé of similar cases on record:

Morton.[5]—Ten examples, presumably in five successive generations. Father, two sons, grand-daughter, her three sons, two children of one of these and one child of another. Direction of dislocation in nearly all inward and upward.

Bresgen.[6]—Ten examples in three generations: Mother, two daughters, a son free, but his son affected, one of the daughters with all six children affected. Direction in all upward and inward.

Keyser.[7]—Nine examples in three generations. Father, daughter and three sons, and the daughter's three sons and a daughter. Direction downward and outward.

Williams E.[8]—Three examples in two generations. A father, son and daughters. Direction not stated.

Sippell.[2]—Three examples in two generations. Dr. Sippell himself, his mother and a brother. Direction not stated.

Dixon.[9]—Four examples in two generations. Mother and three sons. Direction, two upward and inward, one inward, one upward.

Tiffany.[10]—Eight examples in two generations. Father and seven of his nine children. Direction, all varieties represented except downward.

Wordsworth.[11]—Six examples in three generations. Mother, two sons and three grandchildren. Direction in all upward and outward.

Parker, E. F.[12]—Five examples in three generations. Mother, daughter and three grandchildren. Direction in all upward, or upward and outward.

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DISCUSSION.

Dr. W. H. WILDER, Chicago—I doubt if the time allowed us will be sufficient for all the work before the section and I think in this connection I will briefly relate the cases of ectopia lentis recorded in my paper. A woman 39 years of age, came to my service in the Illinois Eye and Ear Infirmary, bringing her child, Maggie, 10 years of age, who complained of bad sight. Examination showed a dislocation of the right lens outward and of the left lens outward and upward. I examined the mother and found a dislocation of the right lens upward and outward, and of the left upward and inward. I then had her bring all of her children for examination and two of the four living had dislocation of the lens. The second child, Joe, aged 5 years, had both lenses dislocated symmetrically inward. In all the cases the lenses were perfectly clear and transparent and the details of the fundus could be seen through the lens, or through the aphakic pupil. In all the vision was considerably impaired and could not be improved by glasses, probably because the edge of the lens interfered so much.

In all probability these are illustrations of dislocations occurring during three generations, because I found that this woman's mother was reported to have had very bad sight that could not be corrected by glasses.

Dr. FEANEL B. TIFFANY, Kansas City—The Doctor has already referred to my cases and, as he stated, the displacement was upward and outward, except in one case, I think, in which the dislocation was inward. As has been said, the lenses in these cases were perfectly transparent and when the pupil was dilated the vision was very much improved by glasses. I recommended in these cases that an operation should be performed, the lenses to be removed, and I think the vision might have been very much improved if the operation had been performed and glasses adjusted, but I did not get the consent of these patients.

Dr. L. W. FOX, Philadelphia—I was very much interested in this report and I have just one thing to add, that is, concerning the difficulty in operating upon these cases. Quite recently I attempted to perform one of these operations in the ordinary manner, but I found it impossible to deliver the lens in that way. The fluctuation warned me that I should have a flow of vitreous and the lens would slip back, so I immediately took a Bowman scoop and delivered the lens.

The peculiar formation of the lens was of interest. A few years ago, you remember, I showed at the society four cases of black cataract. In examining this lens I found it to bear the same characteristics. In the course of time the patient had good vision with ordinary cataract lenses.

Dr. J. E. MINNEY, Topeka—I have had but one case and it was evidently congenital, though it was not seen until the lady was 35 years of age. The dislocation in both eyes was downward and inward. The vision could not be improved by glasses when I first saw her two months ago and I advised nothing else, as she had useful vision which enabled her to go about and do her housework. Two weeks ago I operated upon her and instead of finding a lens I found a sac filled with whitish fluid. I was determined to do something, and though I lost about one-fourth of the vitreous I kept on until I got out that tough membrane. On my way to this meeting I stopped to see that patient, but she did not meet me. Her husband wrote that she was able to go out in the yard, could see the chickens and tell the difference in their sex, so she evidently had some vision.

Dr. H. M. STARKEY, Chicago—I wish to report, so that it may go into the literature of the subject, some cases that I will publish more fully later on. I had under observation a number of cases in one family, where I believe there was five children and their mother that had double ectopia lentis. I showed three of the children and the mother at the Chicago Ophthalmological Society. Some of these eyes were highly myopic, one requiring a 3 D or 4 D concave lens to obtain a good view of the fundus beside the lens.

CASES OF HEREDITARY ECTOPIA LENTIS.

Presented to the Section on Ophthalmology, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY WILLIAM H. WILDER, M.D.

Professor of Ophthalmology, Chicago Policlinic; Instructor of Ophthalmology, Rush Medical College; Surgeon and Pathologist to Illinois Eye and Ear Infirmary; Ophthalmic Surgeon, Cook County Hospital.

CHICAGO.

The following interesting cases came under my observation in October, 1894, at the Illinois Eye and Ear Infirmary.

Right. Left.

Fig. 1.—Mrs. H., aged 39 years.

Right. Left.

Fig. 2.—Maggie H., aged 10 years.

Right. Left.

Fig. 3.—Joey H., aged 5 years.

Mrs. John H., brought her daughter Maggie, aged 10 years, to the clinic because of poor eyesight, saying the child could not see well at school. R.V.=5/200, L.V.=10/200, only slightly improved with a strong convex glass, + 12 D. No concave glass was found that improved the sight.

Examination revealed congenital dislocation of both crystalline lenses (Fig. 2), the right being displaced directly outward to such an extent that its inner edge did not reach the center of the pupil, while the left was displaced outward and upward to nearly the same degree. There was no opacity of the lenses and the details of the fundus could be seen either through the margin of the lens or through the aphakic pupil. No sign of coloboma could be observed in any part of the uveal tract that was visible, nor of any

other malformation or deformity, either about the eye or any other part of the body. The child was well formed but mentally dull for her years.

The mother, aged 39 years, then informed me that she herself had poor sight and was unable to get glasses that would benefit her. Examination showed an ectopia lentis (Fig. 1). The right lens was displaced upward and outward, the left upward and inward to about the same degree. Both lenses were clear, as was also the pupillary space, so that the details of the fundus could be distinctly seen and no other deformities about the eye were observed. R.V. =12/200, L.V.=5/200. Mrs. H. is a widow, born in Ireland, and has always been in good health. Her father and mother are living in Ireland and are healthy. She recalled that her mother had some defect of eyesight; she was very near-sighted and could not see small objects distinctly. It is quite possible that she also has the same deformity. She gives no history of syphilis and has had no injury of any kind. She has four children living, three boys and one girl—our case—and four dead. The living children are Maggie 10, John 7, Joe 5 and Tom 3 years of age.

One boy older than Maggie died at 16 months, one child died at 3 weeks, one child between Joe and Tom lived 3 months and a baby younger than Tom died at 6 weeks.

I told the mother to bring all her children for examination. I found the eyes of John, aged 7, and Tom, aged 3, normal, and as near as could be determined with such young children, with normal visual acuity. Joe, aged 5, however, showed the mark of heredity (Fig. 3). Both lenses were symmetrically displaced directly inward, although not to the extent seen in Maggie's eyes. The pupils were easily dilated with mydriatic, and as in the other cases, the lenses were clear and the interior of the eye, as far as it could be seen, was normal in appearance. Vision could not be accurately tested, but seemed to be R.=5/200, L.= 8/200, with no marked improvement with glasses.

AN ADDITIONAL CASE OF DOUBLE CONGENITAL MICROPHTHALMOS.

Presented to the Section on Ophthalmology at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY CASSIUS D. WESCOTT, M.D.

INSTRUCTOR IN OPHTHALMOLOGY AT RUSH MEDICAL COLLEGE, ETC. CHICAGO.

During a trip in Minnesota last September, I was asked by my friend, Dr. E. J. Lewis of Sauk Center, to see Maxwell James, aged 2 years, who was said to have been blind from birth.

Upon examination the child seemed to be in perfect health and his development was good for his age. I have been unable to secure a photograph showing the condition of the eyes, but the one which I present will give a general idea of the little fellow's appearance. The lids and orbits were normal. The palpebral fissure of the left eye was not smaller than usual, but the lids of both eyes appeared sunken. Both eyeballs were smaller than normal, the diameter of the cornea measuring no more than 6 or 7 mm. in left eye and 5 or 6 mm. in the right. The iris was present in the left eye, but the pupil was not well made out, because of a small central opacity of the cornea, and the fact that the opaque sclera seemed to shade off into the cornea, leaving a narrow ring of clear cornea between an outer opaque ring and a central circular opacity. The right eye was decidedly smaller than the left. There was almost no clear cornea, the iris showing faintly through the almost opaque membrane. The movements of the eyes were normal, but limited. No cysts could be demonstrated in either orbit and the conjunctiva was smooth and free and gave no sign of past inflammation. There was evidently vision in the left eye, for the child could see to get about, and was immediately attracted by bright objects held before it.

The baby had always been perfectly well and presented no other physical anomaly. The parents were Americans of the middle class, and had always enjoyed good health. They had the appearance of health when I saw them, but both were spare and the mother did not seem to be especially vigorous. She had borne but two children, gestation being without incident and delivery natural in both instances, but both children had been born blind. The first, a girl, had died at 18 months, of some acute infantile disease, but up to that time had seemed well and normal, except that the eyes were almost exactly like those of the little boy, whose case I have just described.

A careful inquiry failed to elicit any cause for these two cases of microphthalmos in the family, and the parents had no theory to suggest. So far as the mother knew, or would tell, nothing had happened during the intra-uterine life of the infants which might interfere with their development. Although an itinerant professor had promised to cure the eyes of the little boy, for $50 cash, in advance, I gave it as my opinion that little change was likely to occur, although it might be possible to slightly improve the vision of the left eye by iridectomy, if it should increase in size with the growth of the child.

Treacher Collins has reported ("Transactions of the Ophthalmological Society of the United Kingdom," Vol. xiii) two cases of congenital microphthalmos, in which he secured specimens and made elaborate examinations. He divides these cases into two classes: First, those in which the eyeball is simply abnormally small, *i. e.*, very highly hypermetropic eyes, in which, beyond the defect in size, there has been no arrest in development. Second, those cases in which the eyes, besides being small, have some other congenital abnormality, resulting from imperfect closure of the fetal ocular fissure. This last class may again be divided into those where there is only a slight defect, and where the eyeball retains nearly its normal shape, and those in which the accompanying abnormality is very gross, the eye being usually exceedingly small, while connected with it are one or more cysts. Thess cysts are often large, sometimes concealing the globe, which is situated at the back of the orbit, so that its presence can not be ascertained by clinical examination alone.

His first case was of the class to which my own probably belongs, and I trust you will pardon me if I quote his report:

> The patient was an infant who died when four days old, from congenital heart disease. The aorta and pulmonary arteries formed one common trunk, and there was a defect in the ventricular septum. The right eyeball measured 19 mm., antero-posteriorly and laterally, and 8.5 mm. vertically. There was a small prominence in the sclerotic posteriorly, immediately below the optic nerve. The iris was well developed, but several delicate fibers stretched across the pupil, evidently remnants of the pupillary membrane. The ciliary body presented its usual appearance. The lens was in its normal position and the vitreous appeared healthy. The retina had

numerous little rucks in it. At the seat of the prominence below the optic nerve there was a gap in the sclerotic, through which a fold of retinal tissue projected.

Microscopic examination revealed no central blood-vessel in the optic nerve. The nerve fibers, after having passed through the lamina cribrosa, all sloped somewhat downward; the upper ones afterward curved backward to the upper part of the retina. Below the optic nerve there was at first no retina, no uveal pigment layer and no choroid, only a mass of nerve fibers with fibrous tissue external to them. This fibrous tissue, representing the sclerotic had, a short distance from the lower margin of the outer optic nerve, a break in its continuity. Into the gap thus formed the nerve fibers passed, expanding somewhat after they were through it and becoming mixed with bodies like those found in the nuclear layers of the retina; external to this nerve tissue was a thin layer of fibrous tissue. On the side of the gap in the sclerotic, farthest from the nerve, the retina commenced with its usual layers, being continuous with the nerve fibers emerging from the gap; around the edge of which, also, the uveal pigment layer turned. The tunics of the eye were traced forward from the break in the sclerotic. The retina was at first seen to possess its usual layers, the uveal pigment was present, also the choroid, which, however, was more cellular than normal and devoid of pigment. A short distance farther on the choroid ceased and the uveal pigment layer became an unpigmented layer of cells.

The left eyeball measured 18 mm. antero-posteriorly, 18 mm. laterally and 16.5 mm. vertically. The cornea measured 8.25 mm. latterly and 7.5 mm. vertically. There was a prominence in the sclerotic posteriorly, below the optic nerve, more pronounced than in the right eye. There was a small coloboma of the iris downward. The lens was situated nearly in the center of the globe, a considerable space being left between it and the posterior surface of the iris; it was almost globular in shape, measuring 5 mm. antero-posteriorly and 5.5 mm. laterally. The ciliary process, thin and much elongated, passed almost directly backward toward the sides of the lens. In the center of the vitreous was a band of fibrous tissue, which passed forward from the back of the globe below the optic nerve to the posterior pole of the lens; this band was broad posteriorly and gradually tapered off as it passed forward. Around this central band the vitreous appeared normal. The retina had some small rucks in it. Below the optic nerve, in the situation of the prominence seen externally, a fold of retina seemed to be included in a gap in the sclerotic.

Microscopically the structure of the cornea appeared normal. In the position of the coloboma of the iris the uveal pigment ended about on a level with the point of termination of Descement's membrane in the fibers of the ligamentum pectinatum. The fibers of the suspensory ligament, passing from the much elongated ciliary processes, sloped backward and a little inward to the sides of the displaced lens, which was very rudimentary in structure. The ciliary body, choroid, uveal pigment, and retina in the upper part of the eye appeared healthy. In the lower part, the ciliary muscle was much elongated, and the choroid could only be traced backward as far as the equator of the globe, its posterior part being absent. The uveal pigment layer, just previous to the termination of the choroid, was thrown into several folds; from this position it was continued backward, first as a layer of unpigmented cells, and afterward as tissue which looked like degenerate retina. The band of tissue passing through the center of the vitreous was composed of bundles of nucleated fibers, with small blood-vessels coursing among them; it was adherent posteriorly to the sclerotic, and anteriorly, where it was very thin and reduced to but a few fibers, it joined the posterior capsule of the lens. The vitreous was continuous with it at the sides. There were no central blood vessels in the optic nerve; all its fibers, after passing through the lamina cribrosa, bent directly downward, the upper ones curving round again to the retina above, which began in a fold. The lower ones seemed to end abruptly at the band of fibrous tissue which passed forward through the vitreous. Below this band of fibrous tissue some very degenerate looking retina, consisting mostly of nuclear bodies, was seen embedded in a gap in the sclerotic. The retina in the lower part of the eye had its inner granular separated into two; some fibers separated by spaces running transversely between them.

Hirschberg reports (*Berliner Klin. Wochenschrift*, 1870) the case of a girl of three months, with double microphthalmos. She was well developed, but her eyeballs, though well formed, were very small. The horizontal corneal diameter on both sides was about 5 or 6 mm. There was coloboma of the right iris, below and inward, and persistent pupillary membrane. In the left eye there was luxation of the opaque lens downward, and a persistent hyaloid artery. The fundus showed an extensive discoloration (coloboma). The child continued to develop and the eyes grew somewhat larger, but no perception of light could be discovered. The parents were perfectly healthy.

Rindfleish described (*Archiv. f. Ophthalmologie*, Leipsic, 1891) a case of bilateral microphthalmos, with cystic posterior ectasia, complicated with hydrocephalus. The ventricles were dilated, the cerebellum was cystic and the hemispheres of the cerebrum were separated from the cranium by a collection of subarachnoid fluid. The irregularities of the base of the skull had been obliterated by internal pressure. The roofs of the orbits were concave upward, and the orbits thus depressed contained microphthalmic eyeballs, with connecting cystic structures.

Williams of Boston has reported (*Boston Medical Journal*, 1850, Vol. xliii, page 421) a case of microphthalmus, complicated with congenital cataract of both eyes, in a boy 13 years of age. The entire globe was extremely small, and much sunken in the orbit. The iris, in both eyes, was hardly more than half the average size in a new-born infant, the pupil scarcely larger than a mustard seed. The entire field of the pupil in the right eye was occupied by a cataract, apparently formed by the capsule only, the lens having been absorbed. The pupil of the left eye presented an opacity covering nearly its entire area, but a small point existed toward the temporal side, which was not occupied by cataract, and the opacity was less white than in the right eye. Dr Williams successfully operated upon the cataracts, but with what result as to vision I am unable to say.

Bernheimer reports (*Archives of Ophtholmology*, 1894) a remarkable case of hydrocephalus internus, in which the eyes of the patient were normal in external appearance, but very small. The muscular and lachrymal apparatuses were normal in both. The left pupil was not circular. The axis of the left eye measured 12 mm., and lying to the lateral side of the optic nerve was a cyst 6 mm. long, filled with clear fluid. The right eye was continued posteriorly in a thick stalk, and was about the size of the left. In place of the nerve was a sheath containing but a single vessel, and to its lateral side was a cyst continuous with the posterior and inferior portion of the ball. The lens was small, egg-shaped and cataractous. The retina was completely detached and much folded. The optic nerve had a peculiar appearance, and nerve tissue could scarcely be found. A third of the nerve tissue was converted into an egg-shaped cyst, communicating by a narrow cleft with the cavity of the eyeball. The pigment epithelium and the choroid were normal and in position. Near the choroidal ring the choroid was somewhat thickened and choroidal pigment was traced back to the wall of the cyst.

FitzGerald reported (*British Medical Journal*, 1886, Vol. ii, page 1385) a case of double congenital microphthalmos to the Royal Academy of Medicine in Ireland, and exhibited the patient. There were two undeveloped globes, with cornea and iris, but little or no anterior chamber; illumination of the fundus was impossible. The father of the child thought it could see when light was brought into the room, but after having several times made trial with both lamp and ophthalmoscope, Dr. FitzGerald was unable to satisfy himself that the child saw anything. The mother in this case gave a history of a fright

during gestation, but at what period was not stated.

Brailey reports (Transactions of the Ophthalmological Society of the United Kingdom, Vol. x, page 139) a case of double microphthalmos, with defective development of the iris, in a patient with imperfect teeth and arms, seen at Guy's Hospital. Vision of the right eye equalled fingers at 10 feet, and the field was much narrowed all round. Tension was +1 and the eye was myopic about twelve diopters. Vision was not improved by lenses. The cornea was small, about 9 m.m. in diameter. The iris was absent except a narrow crescentic piece in the inner side, which occupied about two-fifths of the circle. The lens was in situ. Its diameter seemed to equal that of the cornea. The disc was cupped and had a myopic crescent to the outer side, and opaque nerve fibers to the inner side. Vision of the left eye equalled fingers moving. Tension was +2 and the eye was myopic. The cornea was the same as in the right eye. The iris was wanting except for three small isolated bits with rounded edge, situated on the inner side of the vertical line. The disc was cupped.

De Vincentiis of Pavia, reports (*Ann. di Ophth.*, Vol. xiv) a case of congenital bilateral microphthalmos, with defective development of the heart. Mayer described a case of microphthalmos with cysts in the lower eyelids. Ginlini reports (*Ztschr. f. Verleich. Augenh.*, Wiesbaden, 1891) a case of double congenital microphthalmos in a dog four weeks old. Holtzke (*Archives of Ophthalmology*, Vol. xii) made careful studies of the eye of a rabbit with coloboma of the iris, ciliary body and choroid, and general microphthalmos. He closes his report as follows: "The explanation of the above-described changes is very simple. There have evidently been extensive inflammatory processes in the eye, and I see no reason why we should not adopt Deutschmann's view (*Klin. Monatsbl. f. Augenh.*, March, 1881) that the arrest of development is only a changed development of the eye in consequence of an intra-uterine inflammation. This inflammation has probably taken place in the latter half of the third week; the fetal fissure was nearly closed, or after having been closed, was again opened; the iris, on the other hand, had not begun to develop. Why this inflammation was just at this fissure, which is so important for the development of the eye, can not be decided, unless it was favored by the greater vascularity of this neighborhood."

Hess reports (*Archiv. f. Ophth.*, Bd. xxxiv) and gives details of the microscopic examination of a series of microphthalmic eyes with colobomata; he found in his cases no sign of past or present inflammation and concludes that it has very much less to do with the production of congenital malformation than is generally assumed.

As I have no specimen to present, and have had no opportunity to make pathologic studies of microphthalmic eyes, I have no theory to offer as to the causation of these anomalies. The appearance of the eyes in my own case would cause one to think immediately of an inflammatory process.

31 Washington St.

DISCUSSION.

Dr. Casey A. Wood, Chicago—I have had personally no experience in these cases outside of some studies that I made with Mr. Lang of London a number of years ago, when an attempt was made to show that cases of true anophthalus, one of the divisions of microphthalmus, was not possible. As was declared some years ago, careful dissection will discover some parts of the eye and in considering the embryology of the eye it would seem strange to think that entire absence of the eye was possible. The experience we had seemed to prove that we only have cases of true microphthalmus to deal with and that there is always some trace of the ocular structures to be found in the cranium.

EXPERIMENTS IN THE USE OF ALUMINIUM FOR ARTIFICIAL VITREOUS.

Presented to the Section on Ophthalmology, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY D. C. BRYANT, M.D.

OMAHA.

Some two years ago, after experimenting with several other kinds of material for an artificial vitreous, I commenced the use of aluminium for this purpose, and so far have met with nothing but very satisfactory results in its use. In the beginning of my experiments a complete hollow ball was used, and the results were about the same as are secured by the use of the glass ball, that is, good results in a majority of cases, with an occasional case in which, sooner or later, the ball was extruded. The fact that this unfortunate result would occasionally occur, led me to try the experiment of using a frame instead of a complete ball, allowing the cavity to fill up with granulation tissue. These experiments were carried on with dogs, and proved fairly satisfactory, the failures, when they did occur, being due to infection, which is very difficult to avoid when the subject is a dog. After allowing the frame to remain in the place for from six to ten weeks, the dogs were killed and the new stump examined. The frames were found to be partly or wholly filled with new-formed tissue, and a slight amount of tissue drawn in from outside. The frames, which were allowed to remain in place ten weeks or more, were practically completely filled, though in none of them had new tissue formation entirely ceased. Through the kindness of Dr. J. S. Foote, Professor of Histology and Pathology in Creighton Medical College, I am enabled to give a report of the result of a microscopic examination of the contents of one of these frames, which had remained in position eight weeks. The report is as follows:

Having completed the microscopic examination of the contents of the metallic eyeball which you presented, I submit the following report: After cutting the ball in two, transversely, sections were taken, cutting from the metallic rim to the center of mass. Beginning at the outer side of the specimen there are to be found the following areas: 1, a layer of new connective tissues, in which are a great number of incompletely developed cells and new blood-vessels. 2, bundles of striped voluntary muscle running perpendicularly to the general direction of the fibers of the mass within. The muscles are not new, and between them are found leucocytes. The muscle is attached to the main mass by a connective tissue layer which is vascular. 3, a layer of connective tissue fairly well developed, in which are many blood-vessels and spindle, branching and irregular cells. Intercellular substance complete. 4, a dense area of blood capillaries, between which are many new embryonic cells. 5, an area of delicate new connective tissue, in which the cells are the most prominent part, and the wavy character of the intercellular substance is less apparent than in the adult stage. 6, an area of blood-vessels and new embryonic cells, exhibiting elongation in one or two directions characteristic of a developing connective tissue. Intercellular substance not developed. From the above it would appear that the contents of the metallic eyeball are made up of tissues drawn in from the outside, and hence, adult in character, and tissue generated from within, and, therefore, presenting the phases of new tissue development.

This report of Dr. Foote's corresponds with the macroscopic appearances presented by these stumps after removal. There is always more or less drawing in of the surrounding tissues, while the main part of the cavity is filled with apparently new tissue. I have used the frame in sixteen and the complete ball in four cases in human beings. Three-fourths of these cases were such as to require, from one cause or another, an enucleation instead of evisceration. In the cases of enucleation there was little more reaction than follows the ordinary enucleation, the recoveries being quite rapid, without complications whatever. In the evisceration the healing process was considerably prolonged, in one case extending over three months before all irritation had subsided. In all of the cases where the frame was used, everything has gone all right so far, there having been no after-trouble, no tenderness or irritation in the stump, and each patient wears an artificial eye with perfect comfort. In one of the cases in which the ball was used, after evisceration, the patient returned a year after the operation, reporting that the ball came out about ten months after he was discharged from hospital.

I am fully aware that the short time, the few experiments and the small number of cases reported here, do not prove that there are not serious objections to the use of the aluminium ball or frame, but the results are good enough, I believe, to warrant the continuance of their use until such objections, if they exist, become manifest. The aluminium has two qualities superior to glass, being both lighter and stronger. Other things being equal, these two qualities alone would make it preferable to glass, either in the shape of ball or frame. For the frame, I think it can fairly be claimed that if once healed in and filled with connective tissue there can be little or no danger of its sloughing or popping out, as will happen occasionally with the ball, whether it be of aluminium or glass. The frame as used by me now is made up of a ball with a complete front and fenestrated sides and back. These, of course, can be of any size to suit the individual case. The technique of the operation and after-treatment, whether the case be one of evisceration or enucleation, is the same as when the glass ball is used, so no time will be used here in their description. The one thing that I would insist upon, in the after-treatment, is the free and prolonged use of cold applications.

DISCUSSION.

Dr. W. L. FOX, Philadelphia—There is one point in Dr. Bryant's paper that I did not understand, that is whether these balls are used only in implantation or also in evisceration.

Dr. BRYANT—I have used them both ways.

Dr. FOX—The point at issue is this, that in proper evisceration I fail to understand how new formed tissue could find its way into these balls, for in the proper Mule's operation the margins of the sclerotic are brought so well together that they close up and become a solid mass. I am glad the Doctor has brought up the question of implantation, for I consider it one of the greatest advancements in ophthalmology. Every ophthalmologist finds ten or twelve years after enucleation a cicatricial contraction of the tissues of the orbit, and there I have found the implantation of great value. In a case reported two years ago I implanted a glass ball where I could not think of anything else to do do, and it proved to be sufficient to hold the artificial eye and pleased the patient so well that I was led to continue the operation. So, today where by any chance I am obliged to enucleate I immediately put in a glass or silver ball. I have found that in nearly every operation we can succeed in making a good artificial stump and it is wonderful what excellent movement follows. It is not as good as the Mule's operation, but it is of great value, for it fills out the artificial eye and the secretions are not retained in the sac but are thrown off, and for this class of patients it produces a heaven on earth.

In an article which will be published shortly in the *International Clinics*, to illustrate the position the glass ball attains I have had these X-ray photographs taken (exhibiting skiagraphs). I want to encourage the gentlemen of this Section to try two things; first, the Mule's operation, and second, the implantation. You will have some difficulty at first in the technique. I am not perfect in it myself, though I have done 125 operations. I have lost four cases; that is, the glass balls came out, and why I can not tell. Instead of using a No. 4 silk I now use the most delicate silk, the 0 or 00, and I believe it the best. Immediately after the operation I saturate a piece of cotton with 1 to 500 chlorid solution, bandage that over the eye and do not open it from forty-eight to seventy-two hours. At the end of that time there will be a slight excoriation of the skin but no pus and no reaction, with positive success.

Dr. W. MONTGOMERY, Chicago—I would like to ask Dr. Fox what his preference is, in implantation, between glass and silver balls?

Dr. FOX—I have no preference whatever and it is simply a question of expense to the individual, as the silver balls cost $1.75 and the glass balls 5 cents. I think it is almost impossible to break the glass balls, for in one of my cases a boy was struck in the eye by a cow's horn and the ball did not break. Unless, then, a bullet be shot into it I think it would be practically impossible to break the glass ball.

Dr. W. H. WILDER, Chicago—I would like to ask Dr. Fox, who has had so much experience in this matter, whether or not in following up any of these cases of Mule's operation he has had any cases of sympathetic ophthalmia, or has known of any that have occurred?

Dr. FOX—I have not had a single case of sympathetic ophthalmia, and I may state here that I have had recently two or three very interesting cases. In one there was evidence of sympathetic ophthalmia beginning—the cilary injection, the keratitis punctata and the dimness of sight all being present. I saw in that case that the fight was on, and it was just at that point where it required a great deal of bravery on my part to do a Mule's operation. I remembered that Carter of London had had a similar case and I settled the question by following him and performing the Mule's operation. In justice to a brother practitioner I must say that he had seen the case and had already started in with heavy doses of mercury, so it may be that the case was at that time on the turn. At any rate three days after the operation the symptoms of sympathetic inflammation had disappeared in a measure and the patient continued to improve. I continued the mercury treatment; of course, giving inunctions as well as $^1/_{10}$ of a grain calomel three times a day. In another similar case, but not so pronounced, I performed the Mule's operation and the symptoms disappeared. So these two cases convinced me that I need not be afraid to perform this operation even when sympathetic symptoms are already present.

Dr. HAROLD GIFFORD, Omaha—It does not seem to me that the distinctive features of Dr. Bryant's balls have been sufficiently appreciated. This framework gives a hold for the sclerotic, as it contracts down and is much less likely to be expelled than a complete sphere. I can claim a slight share in this improvement, because when Dr. Bryant first used aluminum he had ordinary spheres made, but complained that he could not get them made without a hole in them. It occurred to me that the hole might be a good feature and I suggested that it might be a good plan to have more than one hole made for the tissue to grow into.

Dr. BRYANT—Dr. Fox has the advantage of us in the wild

and woolly West in that he has seen many more cases. The most of my cases are seen in working men injured in the railroad shops of my own city, and in the usual year we have perhaps ten to twenty cases. That is all that I have had the chance to see in the last two years. The aluminum ball has the advantage over the silver in that it costs only 4 cents unpolished, and a few cents more for the polishing. It is even lighter than the glass ball and is stronger.

GONORRHEAL CONJUNCTIVITIS AND IRITIS.

Presented to the Sction on Ophthalmology at the Forty-ninth Annual Meeting of the American Medical Association held at Denver, Colo., June 7-10, 1898.

BY FRANK S. MILBURY, M.D.

OPHTHALMOLOGIST, OTOLOGIST AND LARYNGOLOGIST TO THE BEDFORD DISPENSARY AND HOSPITAL AND THE NORTH BROOKLYN EYE, EAR AND THROAT HOSPITAL.

BROOKLYN, N. Y.

Gonorrheal conjunctivitis, or gonorrheal ophthalmia is one of the most serious inflammations met with in the eye. It in produced, usually, by the direct transmission of pus from a gonorrhea into the conjunctival sac. It finds its way to the eye from a urethral or vaginal gonorrhea, or from a similar inflammation in some other eyes, so that the inoculation may either be from the individual himself, as is most commonly the case, or by some one else whose towel has been soiled by the discharge and used subsequently by the patient. Such pus is known to acquire its virulence from the presence of characteristic micro-organisms to which the name of gonococci is given.

The first symptoms may begin within from two or three hours to three days after inoculation. The appearance during the first day may be such as to suggest merely an acute attack of simple conjunctivitis. More frequently the rapidity with which the symptoms set in, and especially the early appearance of more or less chemosis, excites suspicion, and leads to the detection of the source of inflammation. Considerable differences exist in the length of time before the inflammation reaches its full height and leads to a copious purulent discharge. What is usually distinguished as the first stage, in which only a watery and slightly mucoid discharge—often considerable in amount—takes place, may last a couple of days or more, or may rapidly pass on to chemosis, due to a fibrino-plastic exudation beneath the conjunctiva and to intense redness and swelling of the lid. In the most severe cases the infiltration of the conjunctiva is so great that the latter in places appears no longer red, but grayish-yellow, because, as in diphtheritic disease of the conjunctiva, the vessels are compressed by the bulky exudation, and the conjunctiva is thus rendered anemic. The conjunctiva forms a tense, grayish-red wall about the cornea. Quite often the surface of the conjunctiva is found to be covered with clotted exudate like a croupous membrane. The secretion produced by the conjunctiva is like meat-juice; that is, it is a serum which is colored by admixture with blood, and in which float some flakes of pus.

The eye is uncommonly sensitive to contact; the lymphatic gland in front of the ear is swollen, and there is some fever and pain, burning and neuralgic in character; photophobia and lachrymation are constant, and increase as the tension of the swelling of the conjunctiva and lid becomes greater. The swelling of the upper lid generally reaches such a degree as to cause it to hang down over the lid, and to assume a red, glossy appearance on its surface. It is then perfectly impossible for the patient to open his eye, or even to raise the lid to any extent with the finger. The full height of the inflammation is generally sustained for from one to three days, after which the swelling begins to diminish and the lid regains some of its natural wrinkling, and the circulation in the conjunctiva becomes freer. Simultaneously with this there begins a very profuse secretion of pus, which strikes out continually from the palpebral fissure.

In the further course of the disease the swelling of the conjunctiva keeps constantly diminishing, the eye in many cases returning to the normal state within the next four or six weeks. In most cases, however, a condition of chronic inflammation of the conjunctiva remains, which is designated as the third stage of the disease—the stage of chronic blenorrhea.

Some cases—and often, it would appear, the less severe ones—in which the palpebral conjunctiva is much more affected than the ocular, so that the absence of marked chemosis renders corneal necrosis much less imminent, gradually lapse into a chronic state. In these cases the conjunctiva often remains enormously swollen for months, the tarsal portion assuming a thick and more or less velvety appearance, while the retrotarsal folds present large fleshy elevations and furrows, whtch protrude into prominence when the lids are everted. Not infrequently this leads to ectropion. The lower lid is more often ectropic, doubtless on account not only of the smaller size of the tarsus, but also on account of the thickening of the skin produced by excoriation by the overflowing tears and secretion. Occasionally, however, the upper lid is everted as well, the everted portion being hardened and encrusted if not properly attended to.

The most dreaded complication of blenorrhea is the involvement of the cornea, by which, in many cases, incurable blindness is produced. At first the cornea becomes dull and covered with a slight diffused opacity. Then circumscribed infiltrations of grayish color make their appearance, which soon become yellow and break down into ulcers. These infiltrations may be situated at the margin of the cornea and may give rise to a speedy perforation of the latter, and this may prevent the destruction of the whole cornea. In some cases, however, these infiltrations may form a ring around the cornea and become confluent, producing thereby an annular abscess. In that event the cornea is lost, for this ring soon spreads over the whole cornea and destroys it, which usually happens in the most severe forms. Sometimes corneal ulcers are not developed until late in the disease, when the blenorrhea is well on the retrograde path.

The prognosis of the affection depends upon the condition of the cornea and the severity of the case.

Treatment.—First, the great importance of warning patients suffering from gonorrhea, or, in the case of women, from any other discharge as well, of the danger to their own eyes and to those of others living in the same room, in using towels, sponges, etc., in common, and of the consequent necessity of absolute cleanliness can not be exaggerated. One of the most important considerations, when only one eye is affected—and this, fortunately, is the rule—must be to protect the second from inoculation. This may

always be done by tying it up in the following way: The lids are gently closed and kept so by two or three strips of courtplaster. The hollow between the nose and eye is then filled up with absorbent cotton; over this a piece of guttapercha tissue is placed and the whole bound down along the edges with strips of closely-fitting adhesive plaster.

Special care must be taken that this adheres well along the nose, and the patient when in bed should lie as much as possible on the side of the affected eye, to prevent the discharge from trickling over to the other side and possibly loosening the plaster; if it is properly applied there is, however, not much fear of this. Before tying up the sound eye it is well to thoroughly wash it out with an antiseptic solution of corrosive sublimate, 1/6000 to 1/4000. In this way the effect of inoculation, which may have taken place shortly before the patient seeks advice, may in some instances undoubtedly be neutralized.

It is certainly very trying for the patient to have the good eye occluded from vision at a time when the other, owing to the great swelling of the lid, is temporarily useless. He is thereby rendered very helpless and unable to go about alone, so that his spirits, generally depressed as he is, are not raised by his being put entirely in the dark. On this account it is well, where this is possible, to protect the sound eye in a manner which does not altogether interfere with its use. This may be done by strapping a small watch glass over the eye: Dr. Buller's method. This plan has the advantage of allowing one to observe the sound eye all along, and therefore the shield can be left on continually, whereas the ordinary occlusion bandage has frequently to be reapplied. After this is done we turn our attention to the inflamed eye. The treatment to be adopted will depend on the stage of the inflammation and the state of the cornea. When the discharge is only serous and the chemosis slight, pretty frequent washings with corrosive sublimate solution (1 in 5000), and ice compresses, frequently changed, may be used, and the patient's room well ventilated and slightly darkened. When the inflammation comes to its acme, ice may be discontinued, and nothing used but the antiseptic wash and a little vaselin smeared along the edges of the lids. Local bleeding is recommended, but it is of doubtful use; still, it may be tried. The method generally in use is to make a large cut across the outer canthus with a pair of scissors. This at the same time tends to relieve the tension of the swollen lid on the eye. At this stage it is almost impossible to evert the upper lid, so that any attempt at the local application of caustic solution is neither desirable nor always possible. The cornea must be cautiously watched, and any symptoms of loss of vitality counteracted, if possible, by free incisions in the chemosed conjunctiva. However, this treatment is not always efficacious in arresting the dreaded complication, owing not only to lack of nutrition, by pressure on the anterior ciliary vessels, but to actual stasis in them. As soon as the upper lid can be everted without much difficulty, an application of nitrate of silver (5–10 grains to 1 oz.) should be made once or twice during the twenty-four hours, with the object of restraining the discharge and reducing the risk of subsequent inoculation of the cornea. Any ulceration of the cornea appearing at this stage may be treated by applying directly to it the same caustic solution, unless it has begun to heal, when care should be taken that the nitrate of silver does not come in contact with it. Free exercise in the open air is desirable. Atropin to relieve congestion, the bowels kept free, good diet, and opiates when sleep can not otherwise be obtained, constitute the treatment.

Gonorrheal iritis develops in those cases in which gonorrhea has given rise to a general infection; it is closely allied to rheumatic iritis, but is an exceedingly rare form. The inflammation is always severe, and the cause, owing to coexisting inflammatory changes in the joints, is apt to be overlooked. Gonorrheal iritis always seems to occur in both eyes, though not always quite simultaneously, and it may be with different degrees of severity in the two eyes. Successive attacks of gonorrhea are sometimes accompanied each time by iritis, and in other cases, although no fresh inoculation takes place, a return of the joint affections may be accompanied by a recurrence of the iritis as well. The local treatment is the same as for other forms of iritis. Potassium iodid in large doses seems to be the best general treatment at first, followed, as the inflammation subsides, by quinin and iron.

COLPOPERINEORRHAPHY AND THE STRUCTURES INVOLVED.

DEDICATED TO DR. THOMAS ADDIS EMMET AND MR. LAWSON TAIT, IN RECOGNITION OF THEIR LABORS IN THE SURGERY OF THE PERINEUM.

BY BYRON ROBINSON, B.S., M.D.

Professor in the Chicago Post-Graduate School of Gynecology and Abdominal Surgery; Professor of Gynecology and Abdominal Surgery in Illinois Medical College; Professor of Gynecology and Abdominal Surgery in Harvey Medical College; Gynecologist to St. Anthony's Hospital; Consulting Surgeon to the Mary Thompson Hospital for Women and Children.

CHICAGO, ILL.

Continued from page 650.

GENERAL VIEWS.

As we employ perineorrhaphy to repair uterine prolapse (sacropubic hernia) as well as deficiency of the external sphincter apparatus, the subject covers a vast field. All kinds of genital supports—peritoneal, fascial and vaginal sphincter apparatus—must be considered. To have prolapse, both peritoneal and fascial supports must yield, as well as the occurrence of muscular relaxation. No one support to the exclusion of all others can be claimed for the uterus.

The utero-rectal (sacral) ligaments which consist of peritoneal duplicatures, containing fibro-muscular tissue, are very efficient uterine supports. The peritoneum itself, on account of its intimate connection to the pelvic viscera and fascia, doubtless gives considerable support.

The round ligament, with its peritoneal duplicature, the broad ligaments holding some muscular fibers, and the vesico-uterine ligaments all assist in supporting the genitals. In the consideration of sacropubic hernia, the intra-abdominal pressure, the state of the abdominal walls, as well as the visceral supports, should be weighed. Whether the patient has enteroptosis is a very significant question. The peritoneal duplicatures, with their contents, constituting mesenteries of the genitals, elongate in enteroptosis just as they do with the stomach, kidneys, intestines and other viscera. It is not uncommon to find a uterus excessively mobile, due to relaxed supports. Dis-

placements of the genitals not only involve their special supports and the pelvic floor, but the whole peritoneum and the abdominal walls.

It need not be doubted that the mechanism of the pelvic viscera is complicated. The levator ani, closely ensheathed in its superior and inferior fascia, forms a diaphragm through which the viscera find an outlet. By introducing the finger three-fourths of an inch into the vagina, the ledge made by the fascia and muscle enclosing the vagina can be distinctly felt. The muscle normally ensheathed in its scabbard, drives the vagina and rectum directly forward and

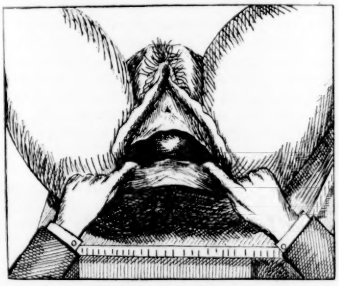

Fig. 10.—(Robinson-Scholer.) A medium degree of relaxed vaginal outlet, to be remedied by colpoperineorrhaphy.

upward toward the pubic arch. The fascia inserts itself into and embraces the lower third of the vagina and is the important support. The levator ani (fascial and muscular) supports lend to the lower third of the vagina a firm fixation, quite immovable, forcing its walls closely in contact for about an inch, producing a pronounced vaginal sphincter apparatus. In marked contrast to the lower third of the vagina is the upper portion, which is lax, mobile and yielding, being surrounded by loose connective tissue only. The urethral portion of the vagina and the neck of the bladder are firmly fixed by the vesicopubic liga-

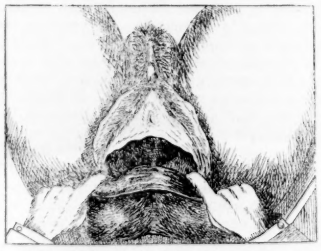

Fig. 11.—Robinson-Scholer.) A high degree of relaxed vaginal outlet, to be remedied by colpoperineorrhaphy.

ments which dwindle off into the white line. This can be seen during respiration with highly relaxed and displaced genitals; the urethro-vaginal portion remains still, while the remainder of the organs move to and fro with each breath or diaphragmatic movement. Superiorly the lower vagina is extremely firmly fixed by the three layers of firm, fibrous fascia —the posterior layer of the triangular ligament, the anterior layer of the triangular ligament, and the deep layer of the superficial fascia. These three powerful and dense fibrous layers originate at the margins of the ischiopubic rami and stretch across the arch of the pubis, surrounding the vagina and being intimately blended in the vaginal walls. To be convinced of the fact that these fibrous laminæ are the all-important supporting structures that not only retain the lower end of the vagina in position but prevent it from being torn away at labor, one needs only to dissect away all supports from the lower vagina except them, and then by tugging and dragging on the inlet of the vagina, note their almost unyielding qualities. Parts of these fibrous layers (triangular ligament) are frequently lacerated in labor, and must be included in the flap-splitting and deep sutures to restore the lower vaginal tube.

Laterally, the vagina is firmly fixed against the descending rami of the pubes, not only by the so-called triangular ligament, but by the levator ani fascia superior and inferior enclosing the levator ani muscle. By introducing the finger for about an inch into the vagina and palpating the posterior and lateral parts, one can feel a blunt band running from the pubic ramus on each side downward and uniting behind the vagina in a still thicker and more blunt band. This is the free edge of the levator ani and its double fascia, where they come in contact and embrace the vagina. The vaginal canal, below the free edge of the levator ani and its fasciæ, is directed forward by the perineal body and triangular ligament while the same body directs the rectal canal backward.

The lower third end of the vagina is quite thick, very vascular, possesses turgidity and is surrounded by some circular fibers. In short, the lower third of the vagina possesses a distinct, vigorous sphincter apparatus which plays an important rôle in the support of the sexual organs and in perineorrhaphy.

In making a division of the supports of the pelvic viscera into those of the peritoneum and those of the sphincter apparatus, we may first make a few remarks on the deficiency of the peritoneal supports. The utero-rectal (sacral) ligaments (extending from the rectum to the neck of the uterus) are the most important of the peritoneal supports. If they relax, the cervix will pass downward and forward, while the body and fundus of the uterus will pass backward. In other words, elongation of the sacrorectal ligaments is the initial stage of retroversion and descensus. Retroversion changes the intra-abdominal pressure from the posterior surface of the uterus to the anterior and superior. After retroversion the intra-abdominal pressure is exercised on the top and anterior surface of the uterus, driving the pointed neck, like a conical wedge downward at every breath. The cervix acts in retroversion as a wedge or cone, and gradually forces the sphincter apparatus to yield. The filling bladder forces the fundus backward and the full rectum pushes the cervix forward, all perfecting the retroversion, the beginning stage of prolapse, by elongating the utero-rectal ligaments.

In colpoperineorraphy, we must not only repair the deficient sphincter apparatus, but the cone-shaped descending cervix must be amputated and its blunt end turned downward, so that it should point and rest against the sacro-coccygeal region (bone and ligaments) instead of attempting to dilate the levator ani muscle at every breath by the change of intra-abdominal pressure. When the cervix once gets firmly into the vulva, i.e., into the vaginal sphincter apparatus, the descent is rapid and inevitable. The upper two-

thirds of the vaginal walls being loose, easily descend with the uterus. In descensus uteri, the vagina is inverted, showing in all probability that intra-abdominal pressure had displaced the uterus first in the process of descent. An intact sphincter apparatus will long retard a descending uterus. The anterior vaginal wall appears first in prolapse; however the vesicopubic ligaments may still retain the bladder in position. Posteriorly, the peritoneum descends with the cervix and upper portion of the vagina. In other words, the upper part of the rectum and vagina are separated, while the lower rectum and vagina are closely connected by a musculo-fascial septum, with the thin edge of the wedge upward.

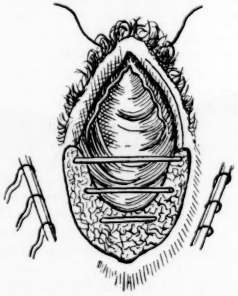

Fig. 12.—(After Hegar and Kaltenbach.) Baker Brown's method, about 1850.

Rare forms of prolapse may occur where the cervix is elongated or where the peritoneum is loosened and stretched. Space forbids reference to many other conditions and kinds of peritoneal supports.

GENERAL VIEWS IN THE DEFICIENCY OF THE SPHINCTER APPARATUS.

The vagina should engage more of our attention, because it is on this apparatus that the operation of colpoperineorrhapy is applied. The primary factor which produces deficiency in the supports of the sphincter apparatus is labor. Other factors play but a secondary rôle.

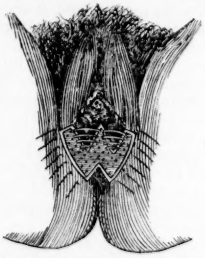

Fig. 13.—Dr. Goodell's method of colpoperineorrhaphy.

The pelvic fascia is not infrequently lacerated near the ischiopubic rami; where the fascial sheath is ruptured the contained muscular fibers also suffer laceration. The results are cicatrices and loss of substance, which may be felt by palpation. The anterior vaginal wall generally escapes laceration, but the posterior vaginal wall is often damaged, showing various sized and formed lesions. Relax action is prominent and closure incomplete. Instead of the curved lower canal with the perfect sphincter apparatus, there is a patulous, relaxed, open mouth, resembling a tobacco pouch which has lost its puckering string. Sometimes the vaginal mouth is closed by an anterior and posterior vaginal fold, for a considerable distance up the vagina. The causes of displacements of the sexual organs are so numerous—as elongation of the utero-rectal ligaments, elongation of the cervix, laceration of the levator ani fasciæ, muscles and triangular ligament, intra-abdominal pressure, enteroptosis—that all possible factors must be considered in repair. Repair must consist in correcting vicious forces, as the pointed cervix should be amputated and turned backward, the posterior vaginal curve should be restored with a perineal body to turn the rectal end back and the lacerated levator ani fascia should be reunited.

An analysis should be made of the factors producing displacements and lacerations in the genital organs. Deficiencies of peritoneal support should be considered distinctly from deficiencies of the sphincter apparatus; however, the both may be often combined. Yet, after all, our chief attention will be directed to deficiencies of the sphincter apparatus, for on it depends prolapse and lacerations, chiefly arising in it. Deficient primary peritoneal supports give rise to vaginal inversion as rectocele, vesicocele, bladder and rectal disturbances, and the vaginal mouth loses its puckering string condition. In coloperineorraphy, the whole of the tissue of the pelvic floor should be utilized for support by forcing it into the median line. This will rest over the tonicity of the pelvic floor and form a firm cicatrix which will prevent sacro-pubic hernia and also reproduce the normal curves of the canals. To accomplish this, extensive denudations or flaps are requisite.

Successful colpoperineorraphy must make the pelvic floor as tense as possible and the newly formed cicatrix will aid materially in its success. The thickened tissue (columns) on the anterior and posterior vaginal walls are remnants of Miller's ducts, which should be and are preserved in both Dr. Emmet's and Mr. Tait's flap operations. They furnish evident support from their fibrous masses. It may be observed that nearly all successful methods of perineorraphy make the denudations in the vaginal sulci on each side, and avoid sacrificing the thickened tissue on the anterior and posterior vaginal walls. Reference to the labors of Bischoff, Martin, Hegar, Kaltenback, Schatz, Emmet and others will show this to be correct. After performing colporraphy posterior, Martin makes what may be called an extension of the perineum forward. This is an excellent method of restoring the anterior curve of the lower end of the vagina. Any surgical procedure, to be successful, must conform to the anatomic structures. The denudation of the lateral vaginal sulci or the flap operations conform to anatomic conditions, and so far have proved successful. The reason denudation in perineorraphy is so successful is because healing in the vagina occurs with considerable certainty.

THE METHODS OF PERFORMING PERINEORRHAPHY.

The methods of perineorrhaphy may be classified into three divisions, viz: Those which started at the vulva (denudation); those which attack the lower vaginal portions (denudation); those which depend on the flap procedure (which embraces colpoperineorrhaphy).

Numerous methods of perineorrhaphy have been tried since the days of Ambrose Paré, Dieffenbach and Baker Brown, when they simply united the superficial tissue which was situated on each side the visible laceration. This was a superficial vulvar procedure and was of small value except to prepare the way for more useful methods.

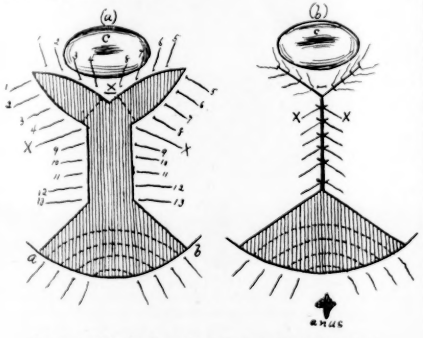

Fig. 14, a and b.—Dr. Reamy's method of colpoperineorrhaphy.

HISTORY.

If the ancients performed successful perineorrhaphy, I am unable to obtain the records. Colpoperineorrhaphy as a modern operation can scarcely boast of being more than a century old. Surgeons sought to prevent prolapse by excising of the vaginal wall so that the resulting inflammation would produce a contracting cicatrix. Others applied caustics for the same reasons. According to Schroeder, Girardin, Laugier employed the blue stone. Phillips used "smoking saltpetre;" so did Laugier, Velpeau, Kennedy, Dieffenbach, Colles and Simon. Chippendale sought to stir up inflammation and cicatricial contraction in the vagina by the very questionable method of infecting it with gonorrheal virus. Operators have attacked the vulva or vagina. The vulva was first attacked by such surgeons as Baker-Brown and Paré. Fricke was the pioneer who performed episiorrhaphy which consisted of denudation of both labia and union by sutures. The failures of Fricke's episiorrhaphy induced later surgeons to operate higher up in the vagina, which finally resulted in the Emmet and Tait methods. Mende suggested denudation in the region of the hymen. Malgaigne thought it should be done deeper in the introitus. Jobert cauterized the vagina when it protruded, and after the exfoliation of the eschar, united the raw surfaces with sutures. Desgranges employed chlorid of zinc to produce cicatricial contraction. Marshall Hall was among the first to employ elytrorrhaphy. He cut out oval or long segments of the vaginal mucosa and united the denuded surfaces with sutures. Dieffenbach formed flaps. Velpeau was one of the first surgeons to do successful perineorrhaphy. Langenbeck and Karl Braun were also pioneers in the operation. Early operators failed on account of lack of anatomic knowledge and prevailing sepsis. It is not many decades since surgeons learned the necessary anatomy to employ in colpoperineorrhaphy. It was learned that the perineum must not only be elongated, but a solid, thick, unyielding pelvic floor must be constructed that the sexual organs can not escape. Perhaps Simon, the predecessor of Czerny at Heidelberg, was the real founder of colpoperineorrhaphy, when, in 1867, he was not only performed but added to it that of posterior colporrhaphy. Simon freshened the vaginal wall with a scalpel, and a fenestrated speculum was placed in the vagina while he freshened the upper part of the vaginal wall by having an assistant introduce the finger in the rectum and force the vaginal mucosa out at the vulva. Veit, Hegar and Speigelberg aided to develop the operation. As time passed, instruments for support were gradually displaced by more perfect operations, owing to more perfect anatomic and pathologic knowledge. Most of the advances are due chiefly to the investigations of Freund, Hugier, Martin, Schroeder, Wilms (1879) and Staude (1880), Breisky, Huepfel and others mentioned in this monograph. The practical execution of colpoperineorrhaphy by the celebrated Heidelberg surgeon, Simon, is the real foundation of subsequent labors. The success attending Simon's addition of colporrhaphy demonstrated that some form of vaginal operation is required in prolapse or deficiency of the peritoneal or sphincter apparatus of the pelvic floor. Celsus, it is reported, reorganized perineal lacerations and suggested rest in bed and tying the legs together, but gave no surgical views of repair. Ambrose Paré, a fertile genius, demonstrated the use of sutures before 1880. He had a pupil named Guillenneau, who

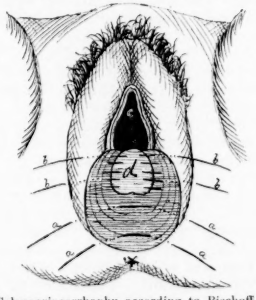

Fig. 15.—Colpoperineorrhaphy according to Bischoff. The tongue-shaped portion of the posterior wall of the vagina, d, is not dissected away. The denudation in this operation is severe and bleeding is active, and should the operation fail much damage is done. a, a, and b, b, show the method of introducing the sutures and the shape of the denuded area.

restored the parts, applied the sutures and secured curves. Sancerotte and Noel secured success about 100 years ago. In 1829, Dieffenbach, surgeon to the Charity Hospital in Berlin, devised useful methods of repair. The deductions which made Dieffenbach celebrated in perineorrhaphy were his methods of lateral incisions (to relieve tension) and confining the bowels by the aid of opium. Chelius opposed this view, insisting that the bowels should be loose. In 1852 Von Langenbeck gave to the world his views through a memoir written by Verhaeghe of Ostend. This definitely advocates the use of the flap and splitting of the rectovaginal septum. Marcy gives credit to Dr. Jenks for originating the flap. Zweifel gives Mr. Lawson Tait credit for the flap-splitting method, to which he is no doubt entitled. Hart and Barbour credit A. R. Simpson with it. Baker-Brown published in 1854 his first edition of the "Diseases of Woman," in which he advocated Dieffenbach's lateral incisions, the use of deep quilled sutures, confining the bowels with opium, and bilateral division of the sphincter.

The perineal sutures were removed the third day, the remainder later, as late as twelve days. All sutures were silk. It appears that Dieffenbach and Baker-Brown realized that the denudation should be carried up into the posterior vaginal wall, the fact which Simon actually demonstrated. It is reported that Mettauer of Virginia in 1830 used lead sutures; other metallic sutures were also employed. In New York, in the Woman's Hospital, Drs. Sims, Emmet and Thomas further developed colpoperineorrhaphy.

At present the operation should be termed colpoperineorrhaphy. New aids have also been developed in regard to the operation, as A. Martin taught for years that one should begin the operation for colpoperineorrhaphy by setting up an involution of the uterus by amputating the cervix. I have amputated the pointed conical cervix to get rid of the dangerous dilating wedge to the sphincter apparatus of the pelvic floor, to prepare for successful colpoperineorrhaphy. A new era appeared in this operation when the flap began to be formed. So far as records are accessible, the late Berlin surgeon, von Langenbeck, in 1852, first described the flap operation in perineorrhaphy. He describes the splitting of the rectovaginal septum making a vaginal flap forward and a rectal flap backward. Langenbeck's description of perineorrhaphy, as translated by Dr. Marcy, is the most important contribution to the subject before the time of Simon of Heidelberg. In fact, it is almost equivalent to Simon's, and in one sense superior—in the use of the flap. Perineorrhaphy was also cultivated by Zary, Mursina, Mensel, Osiander, and Horner. Perineorrhaphy was first performed with silk sutures, the hot iron, and chemicals. About three-quarters of a century ago metallic (wire) sutures appeared. In 1879, Werth published views on the use of catgut (animal ligatures) for buried sutures. Schroeder chiefly introduced the buried spiral catgut sutures in perineorrhaphy. Silkworm gut is one of the best materials for sutures in general use at present. About 1872, Mr. Lawson Tait began the use of a certain flap method, consisting of resplitting the old cicatrix by the use of scissors, reuniting the produced wound surfaces by means of sutures which do not penetrate skin or mucous membrane. The utility of this consists in its application to either, or both, perineorrhaphy or colpoperineorrhaphy. The flap operation was dimly begun by Dieffenbach, in 1829, by his lateral incisions to relieve tension. The flap operation was definitely introduced in perineorrhaphy by von Langenbeck, about 1850 ("Memoire," 1852, by Verhaeghe). In 1861, Colles of Dublin, in a case of vesicovaginal fistula, resplit, instead of pared, the edges, and united the resultant flap. In 1872, John Duncan resplit the edges of an artificial anus and reunited them with interrupted catgut sutures. He forced the flap of mucosa upward and drew the flap composed of musculous and serosa outward, thus increasing vastly the denuded surface for coaptation. Hart and Barbor report that Dr. A. R. Simpson applied this flap method to perineorrhaphy. Not far from 1872, Mr. Lawson Tait applied the flap operation of Langenbeck, Colles and Duncan to the subject of perineorrhaphy. He added to all previous labors the use of sharp-pointed elbow scissors, and the introducing of the sutures without penetrating the skin or mucosa of vagina or rectum. Silkworm gut sutures are employed and may remain in situ for ten days to six weeks. According to Sanger, Stein, a Dane, and Voss, a Norwegian, used similar methods. Later, Hadra, 1887, contributed valuable views on the restoration ot the pelvic floor, as well as Marcy, Jenks, Byford, and Reamy.

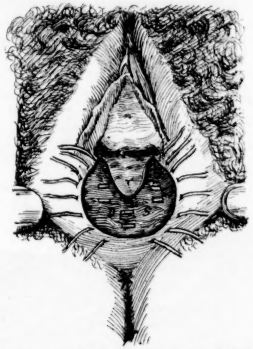

Fig. 16.—Dr. Skene's method. The area D, S, is denuded, with sutures in situ ready for tying. The method resembles that of Hegar and Staude.

The various so-called operations for (colpo) perineorrhaphy are numerous. The first operation devised involved the vulva, the second both vulva and vagina.

1. Ambrose Paré (1580) used simply sutures. His pupil Guillenneau practiced and improved the method (1649). LaMotte, Smellie, Noel Murenna and Sancerotte practiced it.

2. (1830) Dieffenbach, union by sutures, and tension relieved by lateral incisions. Roux (1834) introduced it into France, as well as Mark See (1885), and Palaillon (1885).

3 X. Baker-Brown (1885), union by sutures of the denuded surfaces. Wilms and Staude cultivated it in Germany.

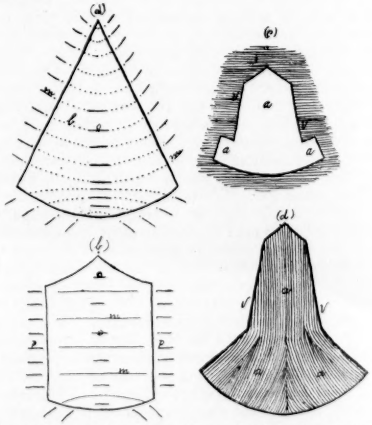

Fig. 17.—Shapes of the denuded areas in colpoperineorrhaphy: a, Hegar; b, Simon; c, Lossen; d, Fitch. In a, and b, the dotted line represent the sutures buried by tissue, the black lines the exposed sutures.

4. The next important contribution and method devised in perineorrhaphy was von Langenbeck's flap method (1850). It was described and performed with a master hand. Von Langenbeck also suggests that

the lateral incisions of Dieffenbach may be added, as it obviates dragging from movements. He advocated removal immediately after the injury, if possible. Von Langenbeck makes several distinct steps in the operation: vivisection of the free border of the recto-vaginal septum; the undoubling of the septum and the formation of the flap destined to form in the new perineum, the anterior side of the triangular space formed by two canals, vagina and rectum, with the perineum as the base; the vivisection of the two lips of the laceration; the insertion of the sutures. In this operation of perineorrhaphy von Langenbeck started the flap method. The flap operation protects the wound from secretions (vaginal or rectal).

5. In 1867 Simon of Heidelberg began the real modern steps in successful perineorrhaphy, which was a combination of perineorrhaphy and posterior colporrhaphy. Simon simply improved on Baker-Brown's method by not only freshening the perineum, but also carrying the denudation high up into the vagina. Simon denuded the vagina by the aid of a fenestrated speculum. The upper angle of the vaginal wall was denuded by introducing the finger into the rectum. Spiegelberg and Veit aided in developing the subject. Englehart wrote in 1871; Banga in 1875 wrote a thesis on "Kolpo-perineorplastik" according to Bischoff. In 1879 Hegar and Kaltenbach made excellent contributions. In 1877 Le Fort, and Neugebaum in 1881, added their labors. In 1877 Dr. Edward W. Jenks of Detroit began the publication of a series of articles on perineorrhaphy which was really a flap method of operating—a distant relative of von Langenbeck's procedure. Dr. Jenks first cut away the flap, but afterward preserved it. The method is almost precisely similar to the flap method attributed to Dr. A. B. Simpson by Hart and Barbour. In 1879 Werth began to use buried catgut to suture the wound. Dr. Bröse, in 1883, used buried animal ligatures. H. O. Marcy published a series of articles (1883) on perineorrhaphy, advocating the flap method and buried animal ligatures, which he first used in hernia in 1881. A. Martin of Berlin contributed excellent labors about 1882. About 1880, Professor Schroeder of Berlin contributed excellent results by the use of the "étage" stitch. It was a continuous running suture of catgut buried in the tissues of the denuded surfaces. As a pupil of Schroeder and Martin, I observed excellent results from this method. Bischoff in part revives the flap operation of Langenbeck. However, his operation was quite influential in its day. Drs. Byford, father and son, made valuable contributions to the subject. History notes that Simpson carried Duncan's flap-splitting to the perineum. Simpson performed a kind of four-flap perineorrhaphy for many years. Perhaps Mr. Tait imbibed some of his views.

(To be continued.)

A LIGATION OF THE EXTERNAL ILIAC ARTERY.

BY G. G. DARLING, M.D.

ANN ARBOR, MICH.

The town of S. may be considered slow and dull, but it is nevertheless patriotic. The Fourth of July was celebrated there, this year, in a truly old-fashioned way, though the only ordnance available was a combination of two anvils and a large wagon-nut. The hole in one anvil was filled with powder, and the nut, two inches in diameter and half an inch thick, was placed over the hole, and likewise filled with powder for good measure. The second anvil was placed upon the nut to confine the charge. The volunteer artillery company did not consider that the addition of the nut to the infernal machine would increase the danger and retreated but a short distance when the fuse was lighted. Don L., a lad of seventeen, was standing on the opposite side of the street, some thirty-five feet from the anvil at the time of the explosion. Simultaneously with the report he experienced a sensation of having been struck a severe blow immediately above the symphisis pubis. There was no pain commensurate with the severity of his injury. A few moments later, blood trickling down his leg apprised him of the fact that he had been wounded. He walked home, a short distance, and Dr. Sheeder was called. Dr. Sheeder states that in examining the patient he found a wound, nearly round and about an inch in diameter, immediately above the pubes and a little to the left of the median line. The deeper tissues fell back into place so that examination with the probe failed to locate the foreign body. When the clothing was examined it was found that two thicknesses of cloth had been cut away from the trousers, leaving a hole about one inch by half an inch in dimensions; a piece the same size had also been cut from the shirt. These pieces of cloth had been driven into the wound by the projectile.

Dr. Sheeder washed the wound with a bichlorid solution, made a counter-opening to the left of the point of entrance, and put a drainage-tube in these openings. The patient suffered but little pain or discomfort. He was kept in bed, on a low diet, and the wound was irrigated daily with bichlorid solution. On the fifth day the fragment of shirt appeared in the wound and was easily removed. At a subsequent dressing fine bits of gravel came away, indicating that the iron struck the ground and rebounded before inflicting the injury. By this time there was considerable induration of the tissues in the inguinal region, so that the thigh was flexed and partially fixed. The urine was passed with difficulty, but more readily when the patient was sitting upon the edge of the bed. On the seventh day, while sitting on the edge of the bed to void urine, there was a sharp arterial hemorrhage from the wound. This ceased when the patient resumed his usual position—on his back with the thigh flexed. The recurrence of the hemorrhage several times under the same conditions alarmed the patient's friends, and counsel was called. I reached S. at 10 P.M., the seventh day after the injury; saw Dr. Sheeder and from him obtained the history as above given. I found the patient quite weak from the loss of blood. He was lying on his back, the left thigh flexed upon the body, with a pillow passed under the knee for support. The left leg was slightly cooler to the touch than the right. There was no femoral pulsation on the injured side. Before proceeding further with the examination, I requested him to sit upon the edge of the bed as he had done previously when the hemorrhage had occurred. He did so, and a sharp hemorrhage followed, which stopped promptly when the horizontal position was taken.

The necessary instruments and the field of operation were prepared, and the patient was anesthetized. After enlarging the skin wound to the left, I passed

my finger into the opening, and was able to feel a hard foreign substance which lay behind Poupart's ligament and beneath the artery. Its relation to the vein I could not accurately determine. When the tissues were pushed aside, the external iliac artery was easily felt and so far exposed to the touch that I could easily grasp it between my finger in the wound and my thumb outside, if hemorrhage should follow the removal of the foreign body. I then seized it with a pair of forceps and withdrew what proved to be nearly one-half of the nut which had been used in firing the anvil. A gush of blood followed its removal, but by thrusting my finger into the wound and grasping the vessel, as I had planned, the bleeding was completely controlled. Under my direction, my assistant, Dr. Burr, cut down to the vessel and secured it with a catgut ligature. A second ligature was passed one-half inch above the first for greater security. Now came the question of ligating the vessel on the distal side of the wound. The clot in the distal portion was already one week old, and the wound was comparatively free from infection; why disturb this natural hemostatic to apply a ligature? Acting on the supposition that a clot which had effectually blocked the artery for a week, must, in the absence of suppuration, be sufficiently organized to continue to do its work, I decided to break a well-established rule of surgery and not ligate below the injured point. The wound was washed and lightly packed with gauze. The opening through which the iliac had been ligated was left to heal by granulation.

Two days later, Dr. Sheeder informed us that another piece of cloth had come away. A week after the operation I went to S. and found the patient doing well in every respect, though the third piece of cloth had not yet appeared. Three days later it presented in the wound, but a vigorous transmitted pulsation warned the doctor that its close connection with the vessel rendered its removal at that time unwise. It subsequently sloughed out without doing any damage, and the wound healed. He does not experience the least discomfort from the change in the course of the blood.

The following features of the case are worthy of note: That fatal hemorrhage did not immediately follow the receipt of the injury; that the iron and the cloth should have effectually blocked the wound in the vessel for a week; that there should have been so little infection or fever; that the formation of a clot made it possible to successfully treat a large wounded vessel by ligature above the wound alone; that in the passage of the iron across the inguinal canal in the upper portion, there should have been no damage to the spermatic cord, and that the external iliac vein should escape serious injury.

SOCIETY PROCEEDINGS.

The Chicago Society of Internal Medicine.

First Regular Meeting, June 23, 1898.

Dr. JOHN A. ROBISON, the President, in the chair, and twenty-seven members present.

Dr. GUSTAV FÜTTERER read a paper[1] entitled

HOW SOON DO BACTERIA WHICH ENTER THE PORTAL VEIN BECOME DISSEMINATED THROUGHOUT THE SYSTEM, AND WHEN DOES THEIR ELIMINATION COMMENCE?

After showing, from the literature, that bacteria can pass through the walls of the intestinal canal, without grave lesions being present, and enter the general circulation, the writer set for himself the task to inquire experimentally whether, after they had entered the branches of the portal vein, the liver would offer any marked resistance to their reaching the general systemic circulation.

In the several experiments the bacillus prodigiosus and the bacillus pyocyaneus were the germs used, and every precaution was taken to prevent outside and accidental contamination and to render the results conclusive. The bacteria, with physiologic salt solution, were injected into the portal vein of dogs and blood taken from a jugular vein, at varying intervals of time, was used to inoculate culture media. As a result of five experiments the author concludes that micro-organisms may pass from the portal vein into the general circulation within one minute's time.

As to the second question: When does the elimination of bacteria commence? the author states that it begins immediately. He has tied the left ureter of a dog, injected bacillus prodigiosus into one of the jugular veins, taken specimens of urine from the pelvis of the corresponding kidney and found identical germs present within two minutes' time. In another experiment upon a dog, the common bile duct was laid bare and a canula introduced and bile obtained after the bacillus prodigiosus was injected into a jugular vein, with positive results after two minutes' time. This experiment, with extraordinary precautions in the technic, was repeated with like results. From these experiments the author concludes that the elimination of micro organisms which find their way into the general circulation is inaugurated at once by the kidneys and the liver.

Dr. BILLINGS said that every practitioner has seen clinical evidence of that which has been verified by the praiseworthy and valuable experimental work done by the author.

Dr. GENTLES said that when it is considered how long the typhoid bacillus may remain localized in the gall-bladder, he could not help feeling astonished at the short time which elapsed between the injection of bacteria into the portal vein and their appearance in the jugular vein, as detailed by the author.

Dr. GEORGE F. BUTLER read a paper[2] entitled

CHRONIC PARENCHYMATOUS NEPHRITIS AND AORTIC REGURGITATION, WITH ENORMOUS DILATATION OF THE HEART.

The case presented was that of a man 65 years of age, who several years ago had acute articular rheumatism and gonorrhea. He dates his present illness to three months ago, complaining of shortness of breath on exertion, cough, palpitation, nausea and vomiting, constipation and great weakness. There are present arterio sclerosis, visible pulsation of arteries of arms, pulse rapid and collapsing, a blowing systolic murmur at apex which is transmitted to left axilla, an aortic diastolic murmur, a double murmur in the femoral arteries, enlargement of the heart especially on the left side, hepatic enlargement, edema of legs, and albuminous urine with hyaline and granular casts. From these symptoms and findings is based the diagnosis of general arterio-sclerosis, chronic parenchymatous nephritis, aortic regurgitation and hypertrophic dilatation of the left ventricle. The mitral systolic murmur is considered as being due to a mitral incompetency secondary to the ventricular dilatation. After discussing further the diagnosis of cardiac valvular disease and exhibiting sphygmographic tracings taken from this case, the author passed on to the subject of treatment. Digitalis was characterized as the typic cardiac stimulant, indicated in all cases of hyposystole, irrespective of the nature of the valvular lesion, but having its action guarded by a vaso dilator in cases such as the one detailed. He advises the use of digitalis in efficient doses, with opium in small doses as a vaso-dilator. In the case given, 15 minims of the tincture of digitalis, with 5 minims of the deodorized tincture of opium, was given, every four hours at first, but with gradually increasing intervals, with excellent effect. In addition strychnia, cholagogue cathartics and a careful diet were employed. In conclusion the author made a plea for individualized treatment based upon a broad pathologic conception of the case and a familiarity with the physiologic action of the remedies employed.

Dr. PATTON had seen the case with Dr. Butler. At that time doubt was expressed by some of the hospital interns as to the presence of aortic regurgitation, because of the effect upon the pulse tracing by the administration of digitalis. As the paper stated, that, and the great enlargement of the heart, which was much larger than is found in any other condition, was regarded as a strong point in sustaining the diagnosis, aside from the presence of a murmur. The tracing is of interest in this connection because some authors still teach that in aortic

[1] Published in full in "Medicine" for July, 1898.

[2] Published, in full, in the Medical Standard for August, 1898.

regurgitation digitalis is a dangerous drug, to be given, if given at all, with caution. This, in the abstract, he had always regarded as fallacious teaching, because we obtain, relatively, the same effect from digitalis in the lesion in question as in any other, only it is necessary to give much larger doses in order to get the same result. For instance, in using digitalin, one of the most active of the alkaloids of digitalis, he frequently gave a dose up to $\frac{1}{5}$ grain of Merck's product, although the books say the dose is about $\frac{1}{50}$ grain and that above $\frac{1}{30}$ grain is a dangerous dose. In this particular class of cases, with the left ventricle secondarily involved, it is necessary to give large doses. Mention was made of the case of a lady of 80 years, with atheromatous stenosis, who is taking, with great benefit, $\frac{1}{10}$ grain doses of digitalin, and the sphygmographic tracings exhibit the same beneficial change as in Dr. Butler's case.

Regarding the administration of digitalis the speaker did not suppose that anyone would attempt to obtain its effects in any valvular lesion without appreciating the dynamic force of the circulation, the relative amount of hypertrophy and dilatation and the peripheral resistance to the circulation. The reason why the heart fails in dynamic power is, that there is a perivascular sclerosis which interferes with nutrition and the heart muscle becomes degenerated and weakened. It dilates and symptoms of a failing heart arise, because the intraventricular pressure exceeds the contractile force of the heart muscle; this can be counteracted by giving something that produces more dynamic force and if digitalis does not do this, he did not know what does. The dose must be such that produces sufficient contraction to overcome the resistance. If small doses do this, well and good; but in his experience he had found that it will take relatively twice as much digitalis to produce the same amount of contraction of the ventricle in an aortic as in a mitral lesion. Failures are often due to disturbance of the normal relation between the peripheral resistance and the contractile force of the heart. The peripheral resistance becomes relatively too great and must be reduced by a vaso-dilator. Opium is very serviceable for this purpose, from 3 to 5 drops of the deodorized tincture usually being sufficient. Such doses are harmless, even in cases associated with nephritis. With the exception of nitrite of sodium, the action of the other vaso-dilators is too transient. Nitrite of sodium is very useful in these cases and the balance of the circulation can often be restored by its use.

Dr. GOODKIND said that he saw, recently, at the Michael Reese hospital, a case similar to that of Dr. Butler's. With marked symptoms of cardiac insufficiency, due to combined aortic and mitral regurgitation, there were general anasarca, double hydrothorax, renal stasis, etc. The patient was given, by mistake, 2 drams of a freshly prepared tincture of digitalis. The error was not discovered for an hour, when the stomach was emptied, bringing away some of the digitalis. The following was the first good night's rest the man had obtained in months. Since then the anasarca has disappeared, the pulse has become more rhythmical, and there has been a very marked improvement in all his symptoms, subjective and objective.

Dr. BABCOCK said that while he believes in the use of digitalis in this class of lesions, he differs with the author of the paper and previous speakers with reference to the dosage. He can readily understand that in many of these cases large doses of digitalis not only may be well borne, but may be absolutely indispensable to obtain the effects desired. This leads him to say with reference to digitalis generally, the dose should be determined by the effects, but on the whole he believes that it should be the smallest which will produce the desired effect. That many times we can accomplish excellent results with small doses if the heart is relieved of much of the burden it has to bear. It is a mistake to pour in digitalis without lightening the heart's work. While he knew that the gentlemen who preceded him realized this fully as well as he did, the general practitioner, who does not see many of these cases, might be led into error by reading a statement that cases of aortic regurgitation in general require larger doses of digitalis than others. One great danger in these cases is the condition of the arteries secondary to or associated with the cardiac lesion. The arteries are sclerotic, and if the left ventricle becomes again powerful in its contractions, and if the vigor of the myocardium has not become greatly impaired, large doses of digitalis might readily cause the heart to throw a volume of blood into the arteries with such force as to cause a rupture of some of the degenerated vessels. He believes this is not an imaginary danger. Furthermore, if the dilatation of the left ventricle is due to the cause assigned by Dr. Butler, viz., the increase in the systole required to overcome the obstacle, rather than to the reflex of blood into the ventricle during diastole, then the digitalis in large doses might bring about an increase of dilatation. Dr. Babcock said he is not convinced that the cause of the dilatation is that assigned by Dr. Butler, but if it is, it seems to him that the reason he assigns is an argument against large doses of digitalis. In the treatment of these cases he lays particular stress upon sufficient rest in bed and the removal of obstacles to the emptying of the left ventricle by lessening peripheral resistance. He also appreciates the wonderful effect of opium in all cardiac cases, but that we must here also speak a word of caution against its general use in connection with digitalis. It is in chronic cases that digitalis has to be prescribed for a long time, for months and often for years, and if opium is combined with it, the opium habit is likely to be formed. The argument might be advanced that if it prolongs life it is of no consequence, but it seemed to him that if we could accomplish with small doses of iodid of potassium practically the same results, so far as the vascular system is concerned, we should use it because it is better for the patient and it certainly is devoid of many evil effects on digestion which are caused by opium, and the nutrition of the patient is a factor of much moment and one which we must never forget, for it is upon the nutrition of the myocardium that the heart depends.

Dr. BILLINGS alluded to the differences of opinion as to the diagnosis and treatment, especially as to the use of digitalis, which, almost of necessity, prevailed among clinicians. He believes, however, that in that form of insufficiency which is due to real, endocardial, valvular disease, there is great risk to life in the use of an agent which causes violent contractions of the heart. In cases due to atheroma and consequent shrinking of the valves there is no possibility, or probability, of washing off any foreign material. As to the use of digitalis in these old people with arterial changes, he believes we all differ in our views, as may be seen by reading the journals and text-books. But he does not think that there is much danger of the rupturing of an artery, because if the heart is so weakened by disease that there is a loss of tension, then there is a lack of arterial pressure, the blood being dammed back on the venous side, as shown by the enlarged liver and spleen and congested kidneys. Digitalis fills the arteries and carries the blood forward. He agrees with Dr. Babcock in that more is to be gained by rest and emptying the right side of the heart than from digitalis. Digitalis forces the blood stream and improves the venous circulation, but this may be done in an easier and less dangerous way. He quite coincided with Dr. Babcock as to the use of digitalis with opium, but thinks opium is contra indicated in cases where the kidneys are involved, with a diminished quantity of urine. In cases of uremia absolute physical rest increases the elimination of urea. In conclusion, he remarked that the longer he practiced medicine the less digitalis he used, particularly in some valvular lesions, and resorts to smaller doses.

Dr. ROSENTHAL considers the state of the pulse the only reliable guide in the use of digitalis. The *pulsus celer et altus* will not allow digitalis, as arterial rupture might ensue. German authors, generally, teach that there is a difference between the tincture and the infusion of digitalis, preferring the latter, and this was also his preference. He considers digitalis inapplicable.

Dr. WELLS stated that his remarks would be limited to the question of diagnosis, which was particularly worthy of consideration in this connection, because the case presented by Dr. Butler was not, from a diagnostic standpoint, a typical one of aortic regurgitation. The murmur, to be sure, is present, but this is one of the least important of the diagnostic features of aortic incompetency; in any case it is only confirmatory, not conclusive evidence. It may be present or it may not; it may be heard at one time and not at another, but that only makes it the more necessary that repeated consultations be made before the final opinion is given as to the presence or absence of a murmur. The matter of sphygmographic tracings had attracted much of his attention for many years, and he believed that in aortic regurgitation the sphymogram was, in the immense majority of instances, highly suggestive, and even distinctive of this lesion. The typic tracing (several of which were presented) is one in which the ventricular wave rises to a great height, is very steep and has a sharp apex; a very rapid fall, often to one-half or more of the ventricular wave; then there is a sharp upturn, the elastic recoil, which also has a rather sharp apex. He had not seen, in his cases, so far as he could recollect, the dicrotic, or peripheral recoil wave absent, and it is always present in typic cases. When fever is present the peripheral recoil may be so marked as to show profound dicrotism. He could not understand how the Corrigan pulse could be absent in cases of marked aortic regurgitation, with enlargement of the left ventricle, even though the right ventricle be also enlarged. The entire question of hypertrophy is an important one, and it must be remembered that when the left ventricle is hypertrophied and

forces the blood through the arteries with great velocity and power, the muscular and fibrous tissues in the arterial walls also become hypertrophied, the whole process, cardiac and vascular, going along, hand in hand. He believes that the peripheral symptoms, the visible pulsation of arteries that normally do not so pulsate, the capillary pulse in the nails, forehead, gums, tonsils, etc., are of great import, yet he must add a word of caution to laying too much stress upon these without careful consideration of the case as a whole.

The PRESIDENT cited the case of a lady of 60 years, with aortic insufficiency, who was confined to her bed for two years on account of hemiplegia. At the end of that time the cardiac dilation was less, her heart was greatly improved, and the secondary symptoms of the aortic regurgitation had disappeared. This case shows what rest alone is capable of doing in these subjects. In cardiac valvular disease he had had great success with the old mixture of digitalis, nitrate of potash and cubebs.

Dr. BUTLER, closing the discussion, said that doctors would differ, although their objects were the same. For this reason he would not take issue with those who differed with him in the points brought out in his case. His experience justified him in the use of remedies as designated by him. Numerous cases of aortic insufficiency had been treated by him in hospital, where the internes had begun with small doses of digitalis, the patients not improving nearly so well as when the doses were increased. In one case 10 minims of the tincture of digitalis had been given three times a day for some time without benefit. The dose was increased to 15 minims and the intervals lessened and in a short time the man was able to be up and around. He quite agreed with Dr. Babcock in the undesirability of giving more digitalis than necessary; if 10 minims were efficient it is enough, but if a dram is required give it. In regard to the danger of rupture of atheromatous arteries from the use of digitalis, he had never seen a case, and did not think the matter especially worthy of attention. He had seen numerous cases of delirium tremens, many of which were old men with sclerosed arteries, who were treated by the hospital steward with tincture of digitalis in large doses, often from 4 to 6 drams, entirely regardless of the condition of the circulation. Marked results were always obtained and no one ever killed. In short, he had never seen any bad effects from the use of digitalis. As regards rest, he quite agreed with Dr. Billings that it is a very essential factor and one which was too often slighted. He had been interested in the tracings exhibited by Dr. Wells, but supposed they were uninfluenced by medicine, whereas his first tracing was without medicine and the others after use of digitalis and opium. Personally, he preferred opium as, judging from his own experience, it did not disturb the digestion so much as potassium iodid, and as to its influence upon the kidneys, he paid no attention to that, as he never gave more than 3 or 4 minims of the deodorized tincture of opium. He had had patients on this treatment for months and they had not formed the opium habit. In cardiac cases with much dropsy he uses diuretin, the theobromin of which causes the diuretic effect, while the salicylate dilates the blood-vessels. The combination spoken of by Dr. Robison he thought especially useful in cases with ascites and hepatic lesions.

Dr. JAMES B. HERRICK read a paper

ON THE EXISTENCE OF EPIDEMIC CEREBRO-SPINAL MENINGITIS IN CHICAGO, WITH REPORT OF A CASE WITH AUTOPSY.[3]

Dr. FÜTTERER had seen, a few months ago, in consultation, a case of epidemic cerebro-spinal meningitis, in a boy of 12, with recovery.

Dr. HOLLISTER had seen a case, fatal on the twentieth day, which had presented all the essential features of epidemic cerebro-spinal meningitis, thoroughly like those seen in severe epidemics of former years.

Dr. BUTLER had seen, recently, two cases; one with recovery within a month, in which the diagnosis of epidemic cerebro-spinal meningitis was positive, and a number of other, hospital, cases in which the diagnosis had been in doubt.

Dr. BILLINGS expressed pleasure in having seen the slides and cultures of the diplococcus intracellularis meningitidis which the author had presented. He had been seeing cases of epidemic cerebro-spinal meningitis, in small numbers, for several years, and in speaking with colleagues, particularly Dr. Church, he believed his experience is but that of others, and that these cases occur, not universally, but in foci, every year in Chicago. In his opinion these cases should be isolated.

THE PRESIDENT stated that he had seen three cases of epidemic cerebro-spinal meningitis in Chicago during the past few months. The diagnosis seemed positive, one dying and two recovering. They were all encountered in the same neighborhood.

Dr. HERRICK, closing the discussion, said that he was sure there were always sporadic cases in Chicago, and this is the testimony of physicians in almost every large city. After epidemics there are always stray cases which creep in here and there. Councilman, in a recent article, mentions this and cites the experiences of some of the older New England physicians who went through epidemics and for years saw cases cropping out here and there. Sporadic cases, he says, are usually present in many of our large cities. Dr. Herrick remembered that during the World's Fair there was a little nest of cases out at the Fair, and he attended one case at the Presbyterian Hospital. Some twenty or thirty cases were sent to the County Hospital, all from the same neighborhood. All the cases which the author referred to in his paper came from a wide area on the West Side—from Lawndale near Twenty-ninth Street on the south to Armitage and Milwaukee Avenues on the north. With regard to the contagiousness of the disease, he could say nothing from personal experience, but from reading Councilman's article he should judge that it was not ordinarily contagious, and he believes Dr. Billings' proposition to isolate these cases is unnecessarily severe. In the Boston epidemic of thirty-one cases only a few came from the same house; the majority being from separate houses. And yet there are those who believe in the contagion of the disease in the ordinary sense of the term. It is a disputed point as to how the organism gains entrance into the meninges. It probably does so through the nose, as is shown by the investigations of Schiff, who found, in examining nasal secretions, that there is present in the nose, in a large percentage of cases, an organism which is either identical with or, at present, indistinguishable from the micrococcus intracellularis meningitidis of Weichselbaum. The experience in epidemics seems to be that the contagious element is a very mild one.

EDWARD F. WELLS, Secretary.

[3] Published in full in this JOURNAL, July 2, 1898, Vol. xxxi, p. 20.

Chicago Medical Society.

Regular Meeting Held in the Society Headquarters, Sept. 14, 1898.

The president, Dr. ARTHUR DEAN BEVAN, in the chair.

The subject for discussion was the

MEDICAL EXAMINERS' BILL,

which was opened with a paper by Dr. J. W. PETTIT of Ottawa. He said there was a growing sentiment among the better class of physicians in the State that some more thorough and practical method of regulating the practice of medicine should be attempted. This sentiment had found expression for several years in addresses, papers and committee reports presented to the Illinois State Medical Society, favoring legislation more in keeping with present needs and conditions. It was not until 1896, however, that any attempt was made to formulate a bill and secure its enactment. The Legislative Committee appointed by the State society that year, recognizing the utter futility of securing the enactment of any law which might be opposed by any considerable number of licensed physicians, and further recognizing the unreasonable and unreasoning antipathy of many physicians of the so-called schools to each other, sought a union of the schools in this effort. The Legislative Committees of the regular, homeopathic and eclectic schools met and agreed to act conjointly. Having nothing to guide them as to the wishes of the profession, they conferred with leading men in all the schools and found them unanimously in favor of the creation of a State board of medical examiners, and separating the license from the degree. With this for their guide, they had Judge Shope, formerly of the State Supreme Court, formulate a bill embodying these provisions, which for lack of time could not be submitted to the profession before presenting it to the last session of the legislature. Being, as it was, a new departure and containing some radical provisions which were not understood, it met with so much opposition within the ranks of the profession that they did not press its passage. This was about what was expected, but served the purpose for which the effort was intended, namely, to elicit a discussion of the subject, and in this way determine the wishes of the profession.

The work of the joint committee last year was to carefully frame a bill which would meet the requirements of the present time, and be a step in advance of any attempt hitherto made, and yet not so radical as to excite such opposition within the profession as to lead to its certain defeat.

While the profession had been found to be almost unanimous in favor of restrictive legislation as a general proposition, a

failure to comprehend or recognize the legal principles which must be observed in framing a measure of this, kind had led to some confusion of details as to methods, and herein lies the difficulty of harmonizing the profession upon some specific measure. Unless it can be clearly shown that such a law is in the interest of the public, it will not stand the test of a judicial decision, as the Constitution expressly prohibits class legislation. Such regulations are under the police power of the State and must be for the protection of the public and not the profession. Whatever advantages may accrue to the profession by such a law must be incidental to the public good. Physicians would demean themselves and belittle the profession were they to attempt to secure the enactment of a law for their own protection. This principle of protection to the public must constantly be kept in view, and any departure from it would nullify any law the profession might succeed in having enacted. Medical license laws are only defensible on the theory that they are needed to protect the public health. Any attempt to favor physicians as a class, or one class of physicians at the expense of others, has been declared illegal, hence the difficulty in determining who should be excluded from the privileges of practice.

Unfortunately, too often regularly licensed and well educated physicians subsequently become notoriously irregular as to their methods of practice, but are still under the protection of their legally obtained licenses. Unless some more practical method is devised than the present cumbersome and inefficient one, the profession might only succeed by the creation of an examining board, in raising the educational standard without elevating the moral tone of the profession.

The renewal clause of the proposed law had this in view by restoring to the licensing body once a year that discretionary power which seems to be the only practicable way to reach this class who make the enactment of such a law necessary. This provision puts the quack on the offensive instead of, as now, on the defensive, thus placing the burden and expense of a trial on him, instead of, as now, upon the Board of Examiners. This difference will operate against the quack as seriously as it now does against the board. It will give the board more latitude in the exercise of its discretion as to what is "unprofessional conduct," and this discretion can not be controlled by judicial tribunals. This will make it possible to withhold a certificate for those offenses which are regarded as unprofessional from an ethical standpoint, but are not usually so regarded by a court or jury.

The serious objection raised against it is that physicians may inadvertently allow their licenses to lapse and thus unwittingly become violators of the law. This can easily be remedied by amending the bill, making it incumbent on the Board of Examiners to notify any delinquent that his license has expired, and giving him reasonable time in which to comply with the law. The trifling annual tax is certainly too small a matter about which to quibble.

The object of this discussion is not only to bring about a better understanding of the Committee Bill which had been sent to the physicians of the State, and make desirable changes, but to stimulate the necessary interest and enthusiasm to secure its enactment. All that seems to be necessary to secure the enactment of this or some other measure into a law is, 1, its endorsement by the medical profession; and 2, the weight of political influence on the part of the profession. When the profession is united on what it wants the battle is won. Without this union of effort for a specific measure, it will be a waste of time and effort to attempt to secure its enactment.

Dr. DANIEL R. BROWER said that the proposed bill referred to by Dr. Pettit would correct the deficiencies of the old one. The State Board of Health should restrict its work to sanitary matters. During his term of service with the Board of about one year's duration, not one-tenth of the time was given to questions of public health, but most of the time was given to the consideration and regulation of medical colleges and the question of medical practice. The proposed bill was an excellent one. The only objection urged against it was with reference to the clause requiring a yearly license. This feature was the only one by which quackery could be suppressed and good work done by the medical colleges of the State.

Dr. N. S. DAVIS, JR., said the regular profession was heartily in sympathy with the general principle of having a licensing board independent of college degree. A bill such as the one proposed should not at any time be advocated as in any sense a piece of legislation for the medical profession only. It was in no sense whatsoever class legislation, but was purely and simply legislation for the benefit of the public. While there were certain sections of the bill that could, in his opinion, be modified advantageously, yet if there was any possibility of the bill not passing because of modifying it, personally he would much prefer to have it passed exactly as it had been presented.

Dr. HAROLD N. MOYER said the bill as it now stood met with his unqualified approval in every particular. He therefore moved that the Chicago Medical Society endorse the proposed Medical Examiners' Bill, and pledge itself individually and collectively to support it when it comes up for passage at the next meeting of the legislature; and that the President of the Society appoint a member from each legislative district to further the resolution. This resolution was seconded and unanimously carried.

The proposed bill was further discussed by Drs. D. W. Graham, Sanger Brown, A. W. Baer, H. H. McAuley, J. S. Christison, Arthur Dean Bevan, and the discussion closed by Dr. Pettit.

SELECTION.

The Epilepsy of Napoleon.—No life in its singularity better supports my theory that epilepsy is fundamental to genius, than that of Napoleon, as he was surely one of the most complete examples of genius. He not only had motoria convulsions, followed by sleep and unconsciousness; excessive violence without cause, so common to genius, but the phenomena rarely noted in psychic epilepsy—momentary mental absences. Nor was an hereditary cause lacking. It is well known that epilepsy is often inherited through parents addicted to alcohol. Napoleon himself confessed to Antommarchi that his father drank, and he died young of a cancerous affection. He was talented, intriguing, and lacking, or almost entirely so, in moral sense. It was known he was an old friend and follower of Paoli, whom he abandoned at the time of his exile, and thenceforth became a client of the French governors. Napoleon's sisters were very immoral, especially Pauline, who was hysteric; it was she who allowed herself to be sculptured nude by Canova. Lucien was selfish, avaricious and sensual. The mother, however, was a woman of solid character, resolute, intelligent and imperious.

Napoleon was short of stature, barely five feet tall, though he measured five feet, six and a quarter inches from finger-tip to finger-tip; which is considered by the alienist, a mark of degeneration. The mesocephalic head, with depressed temples, was not lacking in anomalies, especially the heavy jaw, with the pendant lemuria that is familiar to us all, the salient cheekbones, arched zygomatic bone and scanty beard, which one sees in his youthful portraits, before adulation had transformed the expression of his face. The upper and lower parts of his body lacked proportion, the legs being too short in comparison to the trunk; the head sunken between the shoulders, and the back slightly curved. He had hyperesthesia to such an extent that he had his room heated as late as July. He perceived odors when no one else noticed them. He suffered from frequent megrims, and had an exaggerated form of what I call meteorologic sensibility, causing him to feel the approaching changes in the weather, from which he suffered, becoming ferocious when it was damp. As is frequent with epileptics, he had muscular contractions, especially when under strong emotion. In anger the muscles of his calves twitched. When he treated of new schemes he was addicted to what are called Jacksonian convulsions, twisting the right arm and raising the right shoulder, with contortions of the lips and grinding of the teeth. From his youth he had regular epileptic convulsions. At one time at school in Paris, he was to have been punished for insubordination, by wearing coarse clothes and by eating on his knees, but he was seized with such a serious attack of convulsions that the punishment had to be spared. In the journal of travel to Margonza in 1804, kept by an unknown lady of the court, and in Constant's Memoirs, it is stated that on September 10, Napoleon had one of the nervous attacks to which he was becoming subject. Josephine called for assistance and after many hours of anxiety it passed over. The Emperor forbade its being spoken of. Another time Constant saw him in an attack between epilepsy and incubus, lying on his elbows in bed, shaking and screaming; he was awakened with much difficulty, and pretended to have dreamed that a bear was tearing his chest. Talleyrand saw him in a more marked attack, when, in 1805, he went with the

Emperor to Strasburg. One afternoon he saw him go into Josephine's room; soon afterward he came rushing out, grabbed Talleyrand by the arm, almost dragging him into a near room, and confusedly asked him to close the door, when he dropped upon the floor as if dead. "He trembled and foamed with convulsions, which lasted about a quarter of an hour. Soon after, he began talking, then rearranged his clothes, and recommended silence to us; half an hour later he was on his way to Carlsruhe." Like many epileptics, he had a very slow pulse, 48, and later 60 to the minute.

Great were his mental absences. Wolsley declares a military plan was adopted at Borodino which insured success, and that the victory was lost by the actual mental paralysis of Napoleon. At Dresden, as after the battle of Moscow, he lost the fruit of the battle by a sudden mental absence which prevented him from making a decision; at Moscow he did not decide to comply with the request of his generals and order out the reserve to pursue the Russians. His mind certainly was not clear when, at Vasarvi, simply because he was affronted at not receiving a reply from Alexander, he decided, almost without preparation, upon a plan of invasion against a solid war-like people, protected by the steppes, the cold, and above all by intense patriotism. He was entirely lacking in moral sense, as is common with epileptics, which Taine justly says, made him a great leader. Thus at Cherasco he said to the Savoyard general with whom he was treating for an armistice: "I wanted to demand in the treaty that was being closed, a fine picture of Gérard Dow, which belongs to the king, and is one of the masterpieces, but I could not see how to put a picture in an armistice, and I feared it would seem a strange freak, especially having the fortress of Coni attached to it." It is the language of a brigand making a redemption. In his talk with Metternich at Dresden, when the latter remarked that the late war had cost 200,000 lives, Napoleon answered: "What are 200,000 men to me?" Napoleon's complete lack of moral feeling was reflected in the phrase, although purely official, of the bulletin issued from the horrible Russian carnage: "The health of the emperor was never better." No Asiatic despot, even in ancient times, could have dictated a sentence more jarring on the mournful scene of death from which it was issued. Madam Remusat relates of Napoleon's having said in a conversation with Josephine: "I am not like other men; moral and social laws were not made for me." Upon another occasion, in reprimanding the Bishop of Grand, who did not wish to give his oath, as it conflicted with one he had already sworn, Napoleon said: "*Eh bien monsieur*, your conscience is nothing but stupidity." The evening of the 13th vendemiaire, being present at the arrangements of the insurrection of the sections, he said to Junot: "Ah! if the sections would only place me at their head, in two hours I would install them at the Tuileries, and would clear out all the miserable conventioners." Five hours later he headed the conventioners, and had opened fire upon the Parisians. These qualities did not develop late, but were manifested at an early age; even in college he was reticent and deceitful. His worthy uncle, Corso, prophesied a splendid future for Napoleon, because he was *master of falsehood*; the eulogium which Napoleon reversed upon Metternich.

His baseness reached the point that at a public banquet he spilled some oil on the gown of a great lady, of whose honor he wished to rob her, that he might have a pretext to retire with her into the next room. One should read his recently published correspondence to see how, aside from the monumental Cæsarean style of his proclamations, he used a coarse, slangy language. It is known that many of the worst letters have been suppressed and will never be seen. How unfortunate that he should have shown these qualities even in treating with sovereign and foreign ministers of state; insulting them in his proclamations, his letters and his audiences; revealing their love intrigues, whether actual or supposed. The bulletins 17, 18 and 19 after the battle of Jena, openly accuse the Queen of Prussia with an intrigue with Alexander of Russia. His unlimited selfishness was shown in Egypt and in Russia when, at a time when everything depended upon him, he abandoned the army for the sake of saving himself. He would never have raised his brothers and brothers-in-law and many of his generals, except to have them as instruments in his hand, as reflectors and magnifiers of his own light. He thrust them cruelly against their people for his own interests. When he crossed into Italy the first time, he began with the phrase "my soldiers" and "my army," and finished by talking of "my people," "my senate," and even of "my bishops," and "my cardinals," as though they were his puppets. For arranging, directing and mastering the practical affairs of life, such incomparable and lively passions form a tremendous force.

This force was Napoleon's selfishness; not the inactivity of the many, but active, aggressive selfishness, developed to the point of creating an infinite *Ego*, so that in the vast domain in which it acts it can not suffer another existence, unless it be an appendage or an instrument of its own. As a child this charateristic existed in him in embryo. He was rebellious at every reproof; without scruples, without conscience; intolerant to rivals, ready to fight any one who would not give way to him, while he accused others of attacking him. He considered the world as a magnificent banquet open to all, where to be well filled it is necessary to have long arms and help one's self first, letting others have only what is left. Man, according to him, is dominated with his same selfish passions of fear, cupidity, self-love and emulation. Napoleon never departed from these ideas, nor could he; they being a part of his character, he saw man as he choose to see him. His selfishness, reflected in ambition, took such possession of him as to kill his conscience, and ambition finally caused his downfall. It was not enough that his functionaries were active and zealous; after having killed every critical sense in the man, he must belong to him body and soul; and in the slightest observance he suspected a conspiracy or an attempt upon his majesty. He demanded every agreement of service from his functionaries—even though criminal—from the falsification of the Austrian and Russian notes in 1809 and 1812 to the projection of an infernal machine against the Bourbons, in 1814. Gratitude was unknown to him; when a human instrument no longer served him he cast it away. Peace for him was an armistice during which he prepared for a new campaign. It was for this reason that all Europe, taught by experience, united after 1809 in turning against him. Napoleon, instead of considering his own personality secondary to the State, considered the State secondary to his personality. He had no regard for the future and sacrificed it to the present. "If my successor is an imbecile, so much the worse for him." He made the press a slave to Censorship, and even prohibited works of statistics and economy, if they appeared to cast doubt upon his infallibility. It was the same with the schools. He wrote to his councillors of State: "In establishing a corps of instruction my aim is to have a means of directing public opinion in politics and morals." As Renan said, school was for him the vestibule of the academy. G. Gorion was sent to prison for having called his coronation with the iron crown an absurdity, and Lattanzio was committed to the insane asylum for saying Napoleon would make himself king of Italy. His brother Joseph said Bonaparte would have had no peace if he could have supposed that after his death everything would go on quietly and smoothly. He forced France into an abyss, conscious that he was deceiving her; by misdeeds and an abuse of confidence there grew by degrees the divorce between his own interests, such as he understood them, and the public interest. Napoleon ended by becoming the slave of his monstrous conceptions and his limitless ambitions. Even though the expedition into Russia had not ended disastrously, some other misfortune would have overtaken him. In order to carry out such an enormous campaign it would have been necessary to have a tremendous combination of forces. The fate of Napoleon's subjects was reduced to a military career or obligatory administration. In 1810 there were 160,000 men who refused to serve, and in 1811 and 1812 60,000 were arrested. Meantime he had made 4,000,000 victims; France was reduced by two foreign invasions, made a suspect of Europe, surrounded by menaces of odium and envy. This was the political work of Napoleon; the outcome of selfishness supported by genius. With his false image of glory he promoted what may be called the military and bureaucratic degeneration of France; the worst calamity that can overtake a civilized nation. In all this he showed an impulsiveness and above all a brutality common to epileptics. As Bonfardini says, he mistook brusqueness for dignity, his own caprice for moral law, anger for justice and insolence for truth. It is told that he kicked Volney when he said that France wanted the Bourbons, and gave Bertier a cuff when he saluted him inoportunely, as "Roi de France." While the treaties of peace were being made with the Count Cobentzel, Napoleon suddenly broke a valuable vase, saying, "I will break your monarchy in pieces like that." At Boulogne, when the admiral refused to collect the fleet on account of a menacing storm, Napoleon raised his lash upon him, which he had already used several times on some of the grooms. He writes to Prince Eugene, "You will await orders from H. M. were it only to change the ceiling of your room, and if Milan were on fire you should await orders, although the whole city burn while you are waiting." He once violently thrust his brother Louis out of the door. In Dresden, in 1813, he brutally asked of Metternich, at a time when he was indispensable to him, how much England had paid him to represent her interests as he was doing. Intolerant of delays, he

would throw clothes into the fire if he did not easily succeed in putting them on. He scrawled, he did not write. He dictated with unusual rapidity, and if asked to repeat would fly into a passion, which his secretaries sometime provoked for a rest. From childhood he was violent and impulsive. He boasted to Antommarchi that as a child he feared no one, struck and scratched everybody, especially his brother Joseph, whom he would bite and kick until interfered with.

A leader of high talent, between the alternatives of the throne and the gibbet, he made a game of peoples, religions, and government, with incomparable skill and brutality. His gigantic intellect was abnormal for his size. Marbot, a reliable authority, attests that he had marvelous nervous force, and had resistance for a work seemingly incredible. He could spend ten or twelve hours on horseback, with barely four or six hours interrupted sleep, being wakened for his signatures, only to fall immediately to sleep again; and this upon the eve of battle which would keep him in the saddle all day. At Paris, after a day of intense work, he could rise in the middle of the night, dictate to many secretaries, who changed with the precision of sentinels; and in this way go from a conference with his ministers to an audience with literati or artists. "The quantity of facts," wrote Taine' "which his mind stored up and retained, the number of ideas which he produced and elaborated, seemed to surpass human capacity; and always as one of experience, of a practicality which contrasted with the abstractions and theories of his Latin education."

"I think more rapidly than any other man" said Napoleon. In the art of mastering men his genius was superhuman. All his sayings are fire-flashes: "Liberty," he exclaimed, "is the necessity of a small and privileged class, endowed with higher faculties than those of the mass of mankind, therefore you can lessen or infringe upon it with impunity. Equality, on the other hand, allures the rabble." He possessed a faculty which carries us back to the Middle Ages, an astounding constructive imagination. What he accomplished is surprising, but he undertook far more, and dreamed much more even than that. However vigorous his practical faculties may have been, his poetic faculty was still stronger; it was even greater than it should have been in a statesman; greatness was exaggerated into immensity, immensity growing into madness. He was great, yes, but his greatness became a monstrosity. What aspiring, gigantic conceptions revolved, accumulated, superseded each other, in that marvelous brain. "Europe" he said, "is but a mole hill. Only in the Orient, where six hundred millions of men live, can one establish great empires, excite great revolutions." In Egypt he dreamed of conquering Syria, of re-establishing the Eastern Empire; returning to Paris by Adrianople and Vienna. The Orient allured him with the mirage of omnipotence, and in the Orient, he, the new Mahomet, caught a glimpse of the possibility of creating a new religion, while in Europe he dreamed of rebuilding the Empire of Charlemagne; of making Paris the physical, intellectual and religious capital of Europe; assembling within its precincts the princes, kings, and popes who should have become his vassals, then extending his domain through Russia to the Ganges and the Indian supremacy.

From the turmoil of politics rose the artist, creating the impossible in the field of the ideal. One soon recognizes him for what he is, a posthumous brother of Dante and Michaelangelo, though they worked on paper and with marble; he worked upon the sensitive, suffering flesh of living man. Neither in the Malatestas nor the Borgias does one find such an impulsive brain, in which the internal tempest is so continuous, so menacing, so sudden in its flashes, capable of such electrical changes and discharges, and so irresistible in its shocks. In him no idea remained in a mere state of speculation, each was equivalent to an inward convulsion, which immediately extended into an act." This wonderfully reproduces the epileptic mind in its greatest hypertrophy.

Although he traveled through Europe so much he never had a clear idea of the social conditions of the people. He thought that in a hundred years Europe would be Russian or republican. He was blind to the facts of social life. His was an intense intellect, with rays of light in various directions, rather than a solar intelligence which sheds light upon all; he felt the truth in an attack of clearness, or he understood nothing. There were many old contradictions in his politics, as when he re-established the catholic religion and seized the pope. He forbids Gérardin to appear at court, because he is divorced, and later Napoleon is himself divorced. He declares the glory of his race to have risen at the battle of Marengo, and then affects regal pomp and heraldry. One of his oddest caprices was his passion for making marriages; the number he made and imposed was extraordinary. When convalescent at Valencia he married the daughter of his attendant to a young acquaintance. He married his brothers, his sisters, his nephews, almost all his generals. When some one refused one of his sisters, he offered her to another, and obliged the marriage to be consummated in two days. At St. Helena he continued to make marriages among his attendants, and among the children of the generals and governors of his suite. Even in his will, in a codicil, he asked the Duke of Istria to marry the daughter of Duroc. He believed that a star guided him, and at St. Helena he showed fear of a comet. He was superstitious about Friday. When he broke the glass of the picture of Josephine, which he always carried with him, he feared for her life. In making war he always selected propituous days. He had the rudimental form of doubting insanity, and was not able to go through a street, even at the head of an army, without counting the windows in pairs. There is in this great man the combination of genius with convulsive and psychic epilepsy, which is manifested by impulsiveness, mental absences, cynicism, excessive selfisness, and megalomania. And by this example, which can not be an isolated case in nature, one can believe it possible that epilepsy is the substratum of genius.

If we further analyze the phenomenon of genius under the light of the new theories upon epilepsy which are being solved today by the clinics and experimentalists, we see the justice of the conclusion that genius is a form of psychic degeneration, of the species epileptoid. The lesser number of women of genius supports this theory, as women are more rarely degenerate and more rarely have psychic epilepsy. It is proved by the frequent anomalies of asymmetry of the cranium; moral insanity, which I have demonstrated in "Criminal Man" as being a variation of epilepsy; hallucinations, intellectual and venereal precocity, somnambulism, double personality, which has two and sometimes three opposing natures; sometimes obtuse, sometimes exaggerated sensitiveness; the anomalies of the field of view, bluntness of perception, the frequency of suicide, which is very common in epilepsy; and above all, amnesia and analgesia. It is also demonstrated by a roving tendency and strange fears by which one is seized; misonism, and an affinity to criminality, the point of union of which is moral insanity. Add to it the origin and descent from criminals, inebriates, or from imbeciles, which often marks both the genius and the epileptic, and which is seen in the families of the Cæsars and of Charles V. It is shown by insensibility and a lack of moral perception which is common in geniuses. One might doubt the conclusion who does not know the extent of the field of epilepsy in modern times, since intermittent hemicrania, scialorrhea and amnesia are now recognized as epilepsy. Many forms of monomania are but a guise of the disease, at the appearance of which all other pre-existent traces of epilepsy often disappear. It is enough to mention the number of geniuses of the first order who were taken with motoria epilepsy, vertigo or passionate anger, in which they lost themselves absolutely; besides Napoleon there were Molière, Julius Cæsar, Musset, Petrarch, Peter the Great, Mahomet, Handel, Swift, Richelieu, Charles V., Flaubert, Dostoyewski, Guerazzi and St. Paul. Those who suffered from vertigo were Dickens, Swift, Herschell, Faraday and Marlborough. Vertigo is simply cortical epileptoid which is accompanied by loss of memory or paralysis, as in Dickens and Faraday, and by convulsions, as in Marlborough. As to passionate anger, we recall Peter the Great, the parricide; and Byron, who from childhood fell into such paroxysms that it was sometimes feared he would die of suffocation.

For one who understands the binominal law, according to which no phenomenon is isolated, but always the expression of a series of less-marked though analogous facts, such frequency of epileptic phenomena among the greatest men indicates that it is more extended among geniuses than one would at first think, and that the nature of genius itself must be epileptic. It is important to note how seldom in their lives they have convulsions, and that in such cases the psychic equivalent (which creates genius) is more intense and frequent. Above all, the identity of the two great phenomena is proved in the analogy between the epileptic attack and the moment of inspiration; the unconscious and violent activity which creates in the latter, acts motorially in the former. Most convincing of all is the analyzation of the creative inspiration, which is sudden, intermittent; frequently associated with unconsciousness, irregularity of the pulse and often somnambulism, and not seldom accompanied by convulsive movements of the limbs or followed by amnesia. It is often occasioned by conditions which provoke or increase cerebral hyperemia, and is followed by hallucinations.

The close connection between inspiration and the epileptic attack is pointed out more directly in the words of a great statesman, Beaconsfield: "It often comes into my mind that there is but a step between intense mental concentration and

insanity; I can not easily describe what I feel in that instant, it then seems to me that my senses wander and that I am no longer sure of my existence. I recall often having been obliged to refer to a book to see my own name written to assure myself that I lived. During this state my sensations are incredibly acute and intense. Every object appears animated, and it seems to me that I am conscious of the rapid movement of the earth." A modern novelist says: "It is a fatality that dictates the idea; an unknown force, a supernatural will, a sort of *necessity* to write which directs the pen and in such a way that when the book is written it no longer seems yours, and you wonder how such a thing could have existed in you and of which you had no consciousness; such is the feeling I had in creating 'La Sœur Philomine.'" (Journal de Goncourt.) Zola, too, in the "Roman Naturaliste," gives us this point on the inspiration of Balzac: "He worked under the operation of certain impulses which are a mystery to us; he was the victim of a capricious power. At times for all the gold in the world he could not have written a line, at other times, in the evening, in the middle of the street or in a morning orgie, a burning coal kindled his brain, his hands, his tongue; on a sudden a word awakens hidden ideas which lie fermenting. So is the artist an humble instrument of a despotic power." "My passions," says Burns, "are wild as demons if they do not find a vent in verse." After writing he felt relieved and consoled.

Such are the confessions of Mahomet, St. Paul and Dostoyewsky. In "Besi" he writes: "Suddenly something opened before him, an extraordinary internal light illumined his mind; there are moments which do not last more than five or six seconds, in which you suddenly feel the presence of eternal harmony. This phenomenon is not terrestrial, nor celestial, but something that man in his earthly development can scarcely endure; he would be obliged to transform himself physically or die. It is an ineffable feeling. Suddenly it seems as if you were put in touch with all nature. There is neither tenderness nor joy; there is no forgiveness, because there is nothing to forgive; there is not even love! Oh! it is a feeling higher than love. The joy which fills one is terrible; if this state should last more than five seconds the spirit could not resist; it would have to vanish. During these five seconds I live an entire human existence, and for it I would give my whole life, and should not feel I were paying too dearly." "Are you not epileptic?" "No." "You will become so. I have heard it said that one begins in just that way. A man subject to this disease [evidently it is Dostoyewsky himself] has described minutely the sensation which precedes the attack, and listening to your description it seemed as if he were speaking. He also said that it would be impossible to sustain this state more than five seconds. Do you remember the vase of Mahomet? While it was being filled the prophet flew to paradise. The vase is your five seconds, and paradise is your harmony; Mahomet was epileptic." ("Besi," Vol. i.) And in the "Idiot": "I remember, among other things, a phenomenon which preceded his attacks of epilepsy, the weakness, the mental marasmus, which proved the disease. There were moments in which his brain suddenly became inflamed, and his vital forces all at once rose to a prodigious degree of intensity. The sensation of life, of conscious existence was increased tenfold in these swift moments. A wonderful light burned in his mind and heart. All agitation became calm, all doubts, all perplexities, melted into a vast harmony. But these radiant moments were but the prelude to the last second which was immediately followed by the attack. This second was truly ineffable. When, later, the prince having recovered, reflected upon it, he said himself: 'If these fugitive moments are owing to sickness and the suspension of normal conditions, then they are not of a higher life, but, on the contrary, one of a lower grade. What matters it if it be a sickness or an abnormal tension, when in looking back, recalling and analyzing it, the greatest degree of harmony and beauty are included'?" In this moment did he not have visions analogous to fantastic dreams produced by intoxication with hasheesh, opium, or wine. He could easily judge all these things when the attack ceased. These moments are marked by the extraordinary exaggeration of the inner sense; in the last moment of consciousness which precedes the attack the sufferer can say with full consciousness of his words, "For this moment one would give a lifetime." And without doubt the epileptic in this instant understands the allusion of Mahomet when he said that he visited all the mosques in less time than it took to empty his vase.

That we may see how perfect the correspondence is, compare this description of the psycho epileptic attack with the inspiration of genius, as authors describe it. Berlioz says: "A voice comes from my palpitating chest; it seems as though my heart, under the irritation of an irresistible force, expands as to be dissolved by expansion. Then the skin of my whole body aches and burns, I flush from head to foot. I wish to scream, call the assistance of some one who would console and guide me, and prevent my being destroyed, and detain the life which is ebbing away. I have no thought of death during this crisis, and the thought of suicide is unbearable, I wish to live, live with energies a thousand fold redoubled; it is a prodigious attitude of happiness, and a mania for activity, which can not be quelled except with devouring, furious realization, according to the measure of its intensity." Goethe said that the melody of his verse, like a tiny, independent, impalpable thing, agitated within him before the words were formed, or the thought itself took shape. And Beethoven said, "I have told it, but they did not understand me, as they can not understand the power of artistic inspiration, as they do not understand that I act in accordance with internal laws, unknown to the vulgar, and that I cease to understand myself when the hour of enthusiasm is passed. Fools! In their cold exaltation, in their free hours, they select a theme, they develop, enlarge it, taking care to repeat it in another tone; they add by rule, wind instruments, or some strange combination. All that is very reasonable, very polished, well studied; but could I work so? They compare me to Michel Angelo. Very well; how did the author of Moses work? With fire and furor; in a frenzy, he then made great strokes in the immovable marble, and forced it in spite of itself, to unlock his living thought sepulchered in the block; and I too compose thus. For me inspiration is that mysterious state in which the entire world seems to form a vast harmony, when every feeling, every thought, echoes in me, when all the forces of nature become my instruments, when a shuddering shakes my whole frame, when my hair stands on end." These expressions demonstrate that where genius shows itself in the highest form, and where there is the greatest differentiation from the normal man, in the moment of inspiration he is more or less in that state of unconsciousness which, according to many, is the true character of epilepsy.

"One of the characteristics of genius," writes Hagen, "is the irresistible impulse of the act." And thus is explained by Kant, Coleridge, Voltaire and Cardano, how works of genius can be created in sleep, as this is also a state of perfect unconsciousness, and how the double personality of genius, in the state of inspiration and in the state of normal mind, is a mystery to itself. The most salient characteristic of genius is therefore unconscious creation, which is the most singular, if not the sole phenomenon of epilepsy; and from that, to deduct that it is a specially divine variation of that *morbo sacro* (I do not repeat this synonym without reason) is a step which, even to the least learned in psychic materia, is not difficult. For those who do not know that in many cases the entire attack consists only in a violent excitation of a single sense followed by amnesia, I mention a patient of mine who is seized by a motorial attack, now only by vertigo accompanied by the sight of a bright yellow light; and another whose attack, preceded by aura, consisted in atrocious crural and brachial neuralgia, followed by amnesia. I will add that in some not only the attack, but the whole life, records the psychic phenomenology of the epileptic; but over and above all the example adopted here of Napoleon is enough.—Lombroso: *Rivista d'Italia*, March 15, 1898; translated by A. Goodwin Culver, exclusively for the JOURNAL.

PRAGTICAL NOTES.

The Diazo-Reaction in the Urine.—A. Krokiewicz concludes from a study of 1105 cases (16,167 tests) that the Ehrlich diazo-reaction is one of the most important means in our possession for the diagnosis and prognosis of phthisis and abdominal typhus, and also of primary carcinoma of the ovaries. The results are more or less negative in all other affections, including the renal. It always indicates an acute course of the morbid process or an impending relapse, and is independent of the number of bacilli in the sputa. It can be relied upon in every case of abdominal typhus, and in miliary and nearly every other manifestation of tuberculosis.—*Vienna klin. Woch.*, July 21.

Electric Shock.—This must be treated as promptly as possible, and not only with artificial respiration, but with faradization of the respiratory nerves, the phrenicus, vagus and spinal nerves.—*Munich Med. Woch.*, July 19.

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SATURDAY, SEPTEMBER 24, 1898.

ANOMALIES OF THE DUCT OF MÜLLER AS THE CAUSE OF ECTOPIC PREGNANCY

Rare forms of ectopic pregnancy are those that develop in accessory tubes or in diverticula of the tube. Of each of these varieties HENROTIN and HERZOG[1] have recently described an instance.

At the fimbriated end of the Fallopian tube may be found certain accessory organs, which are somewhat difficult to describe. Some of them, however, are known under the name of accessory tubes. They consist of a canal with an open free end surrounded by fringes, the other end sometimes opening into the Fallopian tube proper. These structures are congenital malformations, resulting from anomalies of the duct of Müller. It must be mentioned, however, that certain authors believe that these structures and orifices may result from inflammatory processes, followed by proliferation of the wall of the oviduct, with hernia of the mucosa. The histologic study of such accessory organs in serial sections has shown conclusively that they depend upon an early embryonal anomaly.

RICHARD[2] found accessory organs in five cases out of thirty; VALENTINE and WILLIAMS[2] two in sixty-one. In the cases observed by KOSSMANN[2] the accessory canal did not have any connection with the oviduct proper, and he therefore believes that these accessory organs result from infundibuliform invaginations of the serous endothelium, and that sometimes such prolongations may connect with the salpinx.

HENROTIN and HERZOG then report a case of ectopic pregnancy which developed in an accessory tube. This was a small organ which communicated directly with the lumen of the oviduct proper, without any interruption or modification in the mucous lining, which consisted of cylindrical cells in single layer, and, according to their statement, they have been unable to find any example of tubal pregnancy in an accessory tube whose canal did not communicate with the duct proper. The instance occurred in a 27-year-old American woman, whose clinical history did not present any peculiar features; the diagnosis of ruptured extrauterine pregnancy was readily made; prompt recovery followed removal of the adnexa and curettage of the uterus.

Diverticula of the walls of the Fallopian tube have long been regarded as playing some rôle in the etiology of ectopic pregnancy, but the number of illustrative cases is so far very small. One of the most complete studies of the tubal diverticula is that by WILLIAMS,[3] who describes these diverticula as developing in the interior of the tube and as extending up to the serous covering; they may be lined by a single layer of cylindrical cells with cilia, presenting therefore all the characteristics of the mucous membrane of the Falliopian tube proper. These diverticula can not be confounded with accessory tubes, because they do not open upon the exterior and can not be readily recognized from the external surface of the tube. In his articles concerning tubal pregnancy ABEL[2] calls attention to the fact that a very tortuous tube may in microscopic sections appear as though its canal is doubled or thrown into diverticula. The only example of ectopic pregnancy in a congenital diverticulum of this kind is described by LANDOIS and RHEINSTEIN. They found an embryo situated in the superior wall of the tube, separated from the cavity of the tube by a band of connective tissue, so that the only explanation of the condition would be the lodgment of the fecundated ovum in a congenital diverticulum.

HENROTIN and HERZOG believe that diverticula of the tube of this kind are due to anomalies of the duct of Müller, which has given origin to a secondary branch. This division may result in a double opening into the uterine cavity. The first instance of this sort was described by BAUDELOCQUE in 1825. The case described by our authors occurred in a patient of twenty-nine. The diagnosis of extra-uterine pregnancy was made clinically, and the uterus and its adnexa were removed. As the result of the careful microscopic examination of the specimen it was concluded that the ectopic pregnancy developed in a congenital diverticulum which terminated in a cul-de-sac, because there was found in this diverticulum the characteristic elements of the decidua. On account of its size it was believed that this diverticu-

[1] Anomalies du canal de Muller comme cause des grossesse ectopiques, Revue de Gynecologie, July-August, 1898.

[2] Quoted by Henrotin and Herzog.

[3] American Journal of Medical Sciences, 1891, cxxviii, p. 357.

lum resulted from a congenital anomaly and not from a pathologic process.

We have abstracted this report because it very clearly emphasized the important rôle that congenital anatomic anomalies may play in the production of pathologic conditions of great significance to the patient.

THE RESPONSIBILITIES OF THE ARMY MEDICAL DEPARTMENT.

In the JOURNAL of August 13, under the title "An Arraignment of the Army Medical Department," we discussed some of the criticisms of the work of Army medical officers elicited by their reported inability to provide for the comfort and surgical treatment of the wounded after the attack on the Spanish lines at Santiago, Cuba. Since then the newspapers have been filled with harrowing reports of suffering in the camps and hospitals, much of which has been attributed to the carelessness, incompetency and inhumanity of the medical men serving with our troops. From time to time the Surgeon-General has given to the press extracts from the reports of officers in active service with various commands, to correct the impressions made by the extravagant headlines and sensational exaggerations of certain of these newspapers. He has also given statements of the provision made for the sick on special occasions, when the charge had been preferred that the Government had made no such provision. But notwithstanding this, so much odium has been thrown upon his department, and particularly on himself, that he has lately given to the papers a definition of the duties and responsibilities of his office. "It would require," he says, "superhuman power to meet the expectation of many of those who have criticised the Surgeon-General for his administration of the affairs of the Medical Department of the Army." He apparently has been held to a responsibility for the care of every individual sick, for he explains that regimental medical officers and medical men in charge of wards in hospitals were assigned to this duty. He has also been held responsible for the sanitary condition of camps, for he explains that brigade surgeons were appointed to look after the sanitary conditions of brigades; division and corps surgeons to superintend the medical department of their commands, the sanitation of their camps and the equipment and efficiency of their field hospitals, and a Chief Surgeon of the armies in the field to exercise general supervision over the whole. It has been urged that the Surgeon-General is responsible for the deeds or misdeeds of his subordinates. This would have held good had opportunity been afforded him to test the qualifications of the men appointed to positions in the medical department of the Volunteer Army; but these positions were filled by the State authorities and the appointees very generally had little practical experience in military methods, and particularly in military sanitation. As a result of this want of experience, regimental, brigade, division and corps surgeons, however competent as medical men and even as sanitarians in civil life, found it extremely difficult, and in most cases impossible, to control the insanitary influences that pervaded the large camps of hastily organized troops, whose line officers were more concerned with the military equipment and drill of their men than with their preservation from these influences. The Regulations of the Army and orders from the War Department published at the suggestion of the Surgeon-General give directions with reference to camp sanitation and the care of the sick, and it is the duty of military commanders to see that these are carried into effect, yet the Surgeon-General has been held responsible for all the faulty conditions that have been developed by failure to carry out these instructions.

The duties of the Surgeon-General are specifically defined, as are those of the regimental surgeon. As stated, he makes the assignments of officers as chief surgeons of corps and divisions. He has charge of all general hospitals and of hospital corps, of the medical supply depots, of the payment of all bills against the Medical Department, and of the collection of all reports and papers relating to the disabilities of individual men in the military service. The general hospitals are those at Key West, Fla., Fort Thomas, Ky., the Leiter and Sternberg Hospitals in Chickamauga Park, the hospitals at Fort McPherson, Ga., Fort Myer and Fortress Monroe, Va., the temporary hospital at Montauk Point, Long Island, and the Josiah Simpson Hospital, a newly finished pavilion hospital of 1000 beds near Hampton, Va. The hospital ships are the *Relief* and the *Missouri*. The failure of Congress to provide a hospital corps for the large volunteer army which was so suddenly brought into existence, had to be met in part by hastily organizing a force of contract nurses. Although the Surgeon-General is responsible for the purchase and issue of medical supplies, it is impossible for him to foresee the local wants in different parts of the country. Hence the necessity for requisitions from the local officers. The difficulty of getting war material to crowded camps has added a medical phrase to the vocabulary of the newspaper reporter, "the congestion of the lines of transportation." This congestion has frequently been the cause of complaint of want of supplies.

It is very evident to one who looks on from the outside, that the difficulties encountered by the Army Medical Department were due to the impossibility of having, in so short a time, an experienced and well-disciplined medical force sufficiently strong in numbers to control the sanitary situation in an aggregation of a quarter of a million of men hurriedly thrown together in military camps. Detailed reports from Santiago show how nobly the medical men of the

Fifth Army Corps acted during and after the fight, notwithstanding the failure of the Quartermaster's Department to land and bring up the supplies; yet the press despatches charged them at the time with carelessness and incompetence. Similar detailed reports, when brought out later, will show as clearly the earnest efforts of the Medical Department, from the Surgeon-General down, to protect the troops in the camps in this country from the effects of their own ignorance and want of military training.

INSANE ARTISTS.

The recent paretic dementia of MUNKACZY, the Hungarian artist, has attracted no little attention to the question of insanity in artists. Prominent among the many contributions to the subject is ARREAT's "Pathology of Artists." In this a large number of artists are described as having either acquired or inherited psychoses. What disappears first in insanity is, as ARREAT remarks, the power of special inhibition and general control. The mind is free to impulses born of disease. The artist loses judgment of images relative to his art which are then offered to him. Disorder begins in his ideas of painting and is shown in his choice of subjects and defects of harmony in composition. Errors in design come first; technical memory long survives, that is, the mechanical association of visual and motor images. Though the professional memory of an artist be a thing acquired and improved, yet it has roots in the association of images composed of innate tendencies formed in specially gifted brains.

Sense of color and its contrasts were deficient in early races. Even as high a race as the Greeks exhibited decided deficiencies in this particular. Primeval and medieval art exhibits the same peculiarity, and it atavistically appears in the insane. In alcoholic insanity and paretic dementia the color sense is often destroyed. LOMBROSO finds that the alcoholic lunatics use yellow excessively in their pictures. One paroxysmally alcoholic lunatic, who lost all sense of color, became very skilful in depicting white, and between his attacks was the best snow painter in France. A paretic dement artist, after the onset of his disease, collected miserable oleographs which he colored green. (*Alienist and Neurologist*, Vol. xiii.) A paranoiac, at one time under KIERNAN's care, painted "A Struggle of the Youth and the Amazons" at its voluptuous termination in various tints of green. The effect, which was ghastly in the extreme, recalled the preference of MURGER for women with green lips. The artist was not color-blind, but attached a peculiar symbolism to this use of green. This was clearly a reversion to a fetichistic canon of art such as regulated the productions of the Egyptians and Greeks and appeared in the middle ages as a consequence of the intellectual storm and stress resultant on Christian reaction against fanatic vandalism. The tendencies to undue use of analogies lead to color and shade otherwise inexplicable. Such uses of color lead to interpretations seemingly at variance with the subject depicted. Thus, as RUSKIN has pointed out, some of CORREGGIO's Madonnas—and the same is sometimes true of RAPHAEL—often suggest voluptuousness. On the other hand, Phryne has been so depicted as to create sympathy for violated purity. Many of these contrasts pushed to the extreme appear to be insane, from the tendency to attach occult significance to trivial analogies. In "His Masterpiece" ZOLA vividly depicts this innate insane tendency to symbolism which causes terrible defects to appear in the otherwise beautiful paintings of Claude Lantier, the artistic brother of Nana, the genius of the degenerate Rougon-Macquart family.

Atavistic tendencies explain the appearance of artistic powers during insanity as the result of a conservative tendency struggling with disease. A hypomaniac period sometimes so removes inhibitions of early training that difficulties are ignored and a seemingly mediocre artist executes a good work. PAOLI reports the case of an insane artist whose copy of a Madonna of RAPHAEL, painted during an attack, gained a prize medal at the exhibition. It is evident from the relative infrequency of artists among the English-speaking insane, as compared with the mechanicians, that a conservative factor has much to do with the appearance of artistic "sports" among the insane. The influence of the same factor is evident in the relative frequency of the insane with artistic tendencies among the patients of the insane hospitals of the Italian districts which have furnished most artists. It is also demonstrable in the atavistic effects of disease on artists who become insane. ANDRIANI found that four out of eight acutely maniacal painters retained their skill during the attack. In two, bizarre ideas appeared, while the work of two more markedly deteriorated, so much so, that in one instance the patient bitterly deplored after his recovery the work done during his insanity.

Paretic dement artists lose all sense of proportion; they begin to stretch trees which, if drawn in their entirety would pass beyond the frame. Exaggeration pushed to the improbable and even the impossible characterizes paretic dementia art, according to REGNARD. One of his patients painted a man whose head touched the stars while his feet were on the earth. As LOMBROSO forcibly points out in the "Man of Genius" paretic dement art effects are generally due to amnesia. Paretics often omit essentials from this cause. In a case observed by FRIGERIO a paretic dement drew a picture of a general seated, but forgot the chair. SIMON had under care a paretic dement who believed himself to be a second HORACE VERNET, yet drew horses with four strokes and a tail.

The most salient characteristic of art in mania is, according to LOMBROSO, absurdity in drawing or coloring due to exaggerated association of ideas through

which the connecting links that would serve to explain the author's meaning are lost. A maniac artist painted "The Marriage at Cana of Galilee." He drew the "Apostles" excellently, but in place of Christ put a large bouquet of flowers. The existence of an archaiac symbolism is here apparent. A periodic lunatic, during the paralucid intervals, painted fairly but with excessive minuteness. During the attacks this minuteness became grotesquely exaggerated.

According to RUSKIN, the grotesque in art is divisible into three kinds: Art arising from healthy but illogical play of imagination in times of rest; art arising from irregular and accidental contemplations of terrible things or evil in general; and art arising from the confusion of the imagination by the presence of truths which it can not perfectly grasp. All these types of the grotesque are found in the insane, particularly the last two. The first is rare, but it does exist. Since art, an early acquirement of the race (as witness the Dordogne caves), is less affected by insanity than later acquirements it results that insanity at times merely tinges art. Thus a periodically insane Italian mason became a painter when a patient at the Pesaro insane hospital. His attacks were always announced by a tendency to caricature the hospital staff, whom he condemned in effigy to strange punishments. The cook offended him, whereupon he painted the cook as a stout, ruddy man in the attitude of an *ecce homo* behind a grating which prevented him from touching the appetizing viands placed before it. A patient of Dr. VIRGILIO drew an excellent portrait of a maniac *in furor*. MANCINI, after his recovery from insanity, painted a "Woman Offering for Sale a Picture Painted by a Lunatic." MAGNONI had remained for fourteen years listless and idle in the Reggio insane hospital. Dr. RANI induced him to paint, whereupon he covered the walls of the ward with excellent frescoes. One of these depicted the story of Ugolino so vividly that a patient threw meat to the father and children to prevent them from starving. According to MAGNAM, GILL came of a family rife with apoplexy and degeneracy. Like degeneratively-tainted dements, GILL had seemingly perfect lucid remissions. During one of these remissions he sent to the "Salon" a picture of a melancholiac with depressing delusions crouching in one corner of a seclusion-room in an insane hospital. Later he sent to the "Salon:" "Salome with the Head of John the Baptist in a Charger." The decapitated head was his own; the plate was simply twenty-franc pieces joined by their edges. The symbolism here evident was certainly not of a purely insane type.

Many artists who have ranked high have exhibited elsewhere than in art their insane taint. While ARREAT claims that LEONARDO DA VINCI and MICHAEL ANGELO were on the "sane" side of the border line, he points out that they exhibited peculiarities. DA VINCI had inchoate persecutory delusions, to which in no small degree were due his errabund tendencies. Independently of MICHAEL ANGELO'S sexual inversion, he had more than one hallucination. He deserted his post in Florence in 1529 when it was beseiged by the imperialists. He thus accounted for this performance to DELLA PORTA:

How did I quit Florence? It is a problem I can not solve. A man came to conduct me to the bastion. There we examined everything, and a voice murmured in my ear, "There is nothing here for those to do who wish to save life and honor." Whether God or the Devil impelled me I can not tell.

TURNER exhibited degenerative taint, while HAYDEN, LANDSEER and ROMNEY became insane. The greatest artist of the English-speaking countries who had a decidedly degenerate insane taint must be admitted to be BLAKE, who was the son of a hosier, and, like TURNER, was of stunted growth. In his youth he exhibited a genius for art and poetry. When a boy, in his father's shop, he drew pictures on the counter and wrote poetry on the backs of bills. He was moody, mystical and led a life of dreamy abstraction. He had hallucinations of hearing; celestial voices called him. He became an engraver, but wrote poetry copiously. Between his twelfth and fifteenth years he had written seventy pages. Visual hallucinations of poets, heroes and princes occurred, which he accepted as real. His designs were revelations which he was commanded to publish by celestial voices. He claimed that from his dead brother he learned that truly beautiful and original method used in engraving and tinting his plates. This spirit counselled him as to the treatment of his best known and most successful works, "Days of Innocence." "Write," said the spirit, "the poetry, and draw the designs on copper with a liquid (which BLAKE always kept secret), then cut the plain parts of the plate down with aquafortis. This will give the whole, both poetry and figures, in the manner of the stereoscope." Jesus Christ taught him how to mix his colors. The "Gates of Paradise," another of BLAKE'S works, ambitious in scope and quite incomprehensible, consists of twenty-seven designs. It is seemingly intended to embody the fall of Lucifer and the creation of man, and swarms with figures demoniac, human, and divine. BLAKE'S colossal egotism is evident in a letter written in 1800 to FLAXMAN:

I am more famed in Heaven for my works than I can well conceive. In my brain are studies and chambers filled with books and pictures of old, which I wrote and printed in ages of eternity, before my mortal life, and these works are the delight and study of archangels. Why then should I be anxious about the riches of fame or mortality?

MOSES, VIRGIL, DANTE and MILTON are seen by BLAKE as "majestic shadows, gray but luminous, and superior to the common height of men." BLAKE'S mind, as ALLAN CUNNINGHAM remarks, at all times resembles the page in the magician's book of glamour which made

> The cobwebs on the dungeon wall
> Seem tapestry in lordly hall.

BLAKE's defects arose from the fact that he did not always clearly distinguish between the real and the ideal visualization. His mind could convert the most ordinary occurrence into something mystic and supernatural. He often saw less majestic shapes than those of the poets of old.

"Did you ever see a fairy funeral, madam?" asked BLAKE of a lady. "Never," was the reply. "I have," said BLAKE, "but never before last night. I was alone in my garden. There was great stillness among the branches and flowers, and more than common sweetness in the air. I heard a low and pleasant sound, and knew not whence it came. At last I saw a broad leaf of a flower move, and underneath I saw a procession of creatures of the size and color of green and gray grasshoppers bearing a body laid on a rose leaf, which they buried with songs and then disappeared. It was a fairy funeral."

He talked, as IRELAND remarks, familiarly with his supernatural visitors. The specters that entered his room were used as models. He would look at them a while, then draw a little and then look up again. Sometimes he would stop at his work, saying that the spirits had walked off. Once he drew King SAUL in armor, but could not finish the helmet because from the way SAUL was standing he could not see the whole of it. Some months after, the specter of SAUL came back, and obligingly stood in such a position that BLAKE could sketch the helmet. Once he was employed to furnish a likeness of Sir WILLIAM WALLACE. In the presence of his employer BLAKE cried out: "Sir WILLIAM WALLACE there—there I see him in all his glory." He commenced to draw, but suddenly paused. When asked why, he replied: "I can not finish him. EDWARD I has stepped in between him and me." "That is lucky," responded his employer, "for I want him also." BLAKE sketched the Plantagenet on a sheet of paper, whereupon his majesty politely gave place to Sir WILLIAM WALLACE. BLAKE's rapid visualization of correlated association was often present. A friend of BLAKE, who collected several of his sketches which illustrate this same peculiarity, once remarked:

Observe the poetic fervor of that face. It is Pindar as he stood a conqueror in the Olympic games. This lovely creature is Corinna, who conquered in poetry at the same place. That lady is Lais, the courtesan. With the impudence which is part of her trade she stepped in between BLAKE and Corinna and he was obliged to paint her to get rid of her.

The most grotesquely curious of BLAKE's visions was his "ghost of a flea," anent which ALLEN CUNNINGHAM cites this history:

This is the greatest curiosity of all. Only look at the splendor of the coloring and the original character of the thing. You see a naked figure, with a strong body and short neck, with burning eyes which long and moisten, and a face worthy of a murderer, holding a bloody cup in its clawed hands, out of which it seems eager to drink. You never saw any shape so strange, nor did I ever see any coloring so curiously splendid—a kind of glistening green and dusky gold beautifully varnished. It is the ghost of a flea, a spiritualization of the thing.

BLAKE one evening was more than usually excited and told the friend he had seen a wonderful thing—the ghost of a flea. "And did you make a drawing of him," the friend inquired. "No, indeed," he replied, "I wish I had, but I shall if he appears again." He looked earnestly into a corner and said: "Here he is; reach me my things; I shall keep my eye on him. There he comes, his eager tongue whisking out of his mouth, a cup in his claw to hold blood, and covered with a scaly skin of gold and green."

The more demonstrably insane productions of certain artists display this symbolic tendency to find the occult in the real. Like another insane artist of less genius but greater suspicional delusions, BENJAMIN HAYDON, BLAKE appealed to the general public with an exhibition of designs chiefly "of a spiritual and political nature." But (ALLEN CUNNINGHAM) the spiritual work and political notions of BLAKE were unlike those of any one else. One piece represented "The Spiritual Form of Newton Guiding Leviathan," and another "The Spiritual Form of Pitt Guiding Behemoth." Those who missed instruction in his pictures found entertainment in his catalogue, which was a wild performance overflowing with oddities and dreams and evidently an enunciation of BLAKE's notions of the laws of art. Anent color BLAKE remarks:

Coloring does not depend on where the color is put on, where the lights and darks are put but all depends on form or outline. Where that is wrong coloring can never be right, and it is always wrong in TITIAN, CORREGGIO, RUBENS and REMBRANDT. Until we get rid of them we shall never equal RAPHAEL and ALBERT DURER, MICHAEL ANGELO and JULIO ROMANO. Clearness and precision have been my chief object in painting these pictures; clear color, and firm determinate lineaments unbroken by shadows, which ought to display and not hide form, as is the practice of the later schools of Italy and Flanders. Oil has been falsely supposed to give strength to colors, but a little consideration must show the fallacy of that opinion. Oil will not drink or absorb color enough to stand the test of any little item and of the air. Let all the works of the artists since RUBENS' time witness to the villainy of those who first brought oil painting into general opinion and practice, since which we have never had a picture painted that would show itself by the side of an earlier composition. This is an awful thing to say to oil painters; they may call it madness but it is true. All the genuine, old, little paintings are in fresco not in oil.

Those "abominations concealed outlines and tricks of color," bringing on one of those visionary fits to which BLAKE was liable; he narrates with the most amusing wildness sundry revelations made to him anent them. Certain painters, according to BLAKE, are demons let loose on earth to confound the sharp,

wiry outlines and fill men's minds with fear and perturbation. He admits that he himself was for some time a miserable instrument in the hands of "chiaroscuro demons," who employed him in making "experiment pictures in oil." Anent which he writes:

These pictures were the result of temptations and perturbations, laboring to destroy imaginative power by means of that infernal machine called chiaroscuro in the hands of Venetian and Flemish demons who hate Roman and Florentine schools. They cause that everything in art shall become a machine; they cause that the execution shall be all blocked up with brown shadows. They put the artist in fear and doubt of his own original conception. The spirit of TITIAN is particularly active in raising doubts concerning the possibility of executing without a model. RUBENS is a most outrageous demon, and by infusing the remembrance of his picture and style of execution, hinders all power of individual thought. CORREGGIO is a soft, effeminate, and consequently most cruel, demon, whose whole delight is to cause endless labor to whoever suffers him to enter his mind.

TITIAN was, however, the most malignant of his persecutors. He told CHARLES LAMB that all the while he was engaged on his water painting, TITIAN was disturbing him—TITIAN, the evil genius of oil painting. BLAKE'S intense belief in his mentally reached visions was so infectious that, as ALLAN CUNNINGHAM remarks, some acute and sensible persons who heard him expatiate, shook their heads and hinted that he was an extraordinary man and there might be something in the matter. His wife, a modest, loving, intelligent but not highly educated woman, accepted the truth of all his visions. As so often happens with paranoiacs, *folie-a-deux* resulted, but, as BLAKE'S persecutors were in the ideal world, no serious consquences followed. BLAKE'S mental defect showed itself in his inability to distinguish the objective from active reproductions of the memory. He partially recognized the mental origin of some of his visions. "The other evening, taking a walk," said he quietly, one night, "I came to a meadow, and at the farther end of it I saw a fold of lambs coming nearer; the ground blushed with flowers and the wattled cote and its woolly tenants were of an exquisite pastoral beauty. But it proved to be no living flock, but beautiful sculpture." A lady present, thinking this a capital holiday show for her children, eagerly interposed, "I beg pardon, Mr. BLAKE, but may I ask where you saw this?" "Here, madam," answered BLAKE, touching his forehead.

As a rule, however, productions of BLAKE'S visualizing powers were facts to him, not mental visions, whence the incomprehensibility of much of his work. When the fact element is uppermost, puerile minuteness and repetition mar the work. The bathos of insane egotism swamps the artist.

Let us have a Department of Public Health!

THE HYGIENE OF MUSIC AGAIN.

Some little time ago this journal editorially called attention to what, in a medical point of view, appeared to be some insalutary possibilities of the over-encouragement of musical culture, and in so doing noticed briefly some of the theories of the origin of the musical sense and emphasized a little the fact that it is essentially a sensuous and emotional faculty, not in any intrinsic sense an intellectual one. An esteemed correspondent has found in the said editorial, matter to which he strongly objects, and accuses us of overmagnifying the value of the merely useful, and underestimating that of the higher incitants of the imagination. As he appears to have misunderstood the whole spirit and tenor of the editorial referred to, it may be well to take up the subject again and state, it may be more plainly, the idea it was intended to convey.

There is no rational being that can honestly deny the utility of the pleasures of life, and music is certainly one of the highest of these. This, however, does not alter the fact that excessive indulgence in any of them not only may be, but must necessarily be, harmful to the individual, and that this is true as well of those that are usually reckoned as higher and more refined as of the grosser sensual appetites and tastes. The difference is mainly one of degree; music does not necessarily or always refine the disposition, and natural brutality may be aggravated by undue emotional excitation in this way as in any other. It does not tend essentially to improve morals any more than intellect; in spite of what Dr. METTLER says there are more than there should be among musical celebrities who have been deficient in the former, and the intellectual giants among them are few and hard to find.

It is not with intellect or morals, however, that the medical interest of the question of the hygiene of music has mainly to do; the point in the editorial referred to was the possibility of its excessive culture inducing morbid developments in impressible subjects, a danger which, it is believed, has been too much overlooked. The question was also raised whether this danger was not augmented with the popularity of certain modern types of music, more particularly that of WAGNER and his followers, the cult of which seems to fall in well with the various "intensity" fads lately in vogue. The emotional erethism incited by some of this modern music must, judging by the language of some of its devotees, be something altogether beyond the comprehension, not to say the appreciation, of the uninitiated. As was said before, their descriptions suggest more than anything else a perversion of a sense and a morbid, unnatural enjoyment. It may not be scientific to quote NORDAU, but there may be more truth than poetry in his characterization or the present dominant spirit in music as a symptom of degeneration. The classic masters of the earlier

half of this century would hardly sympathize with it; if a MENDELSSOHN could not enjoy a BERLIOZ or a LISZT, he could hardly endure a WAGNER or a RUBINSTEIN.

The pathologic possibilities of music are not confined, however, to to the higher-grade music of the concert-room or opera, but may be found in the simplest melodies; anything that can thoroughly stir up the emotions possesses them. It would obviously not be a wise thing to constantly play the Ranz des Vaches to a Swiss mercenary, or "Lochaber no More" to a Highland exile. The over cultivation of music by some impressible individuals has had disastrous effects; its results have been observed in asylums for the insane, and any too general and indiscriminating tendency this way, it is not hard to believe, may have general bad results, if we can credit such an observer as LAWSON TAIT.

The dancing mania of the middle ages is a fair example of misguided and misdirected musical and religious enthusiasm.

It does not follow that because one is able to see these possibilities, he has lost his appreciation of the beautiful, or has been reduced to the level of bald GRADGRIND utilitarianism. Nor does the recognition of the fact, for such it is, that the musical faculty is essentially not an intellectual one, imply that the individual has no musical taste or capacity for enjoyment of sweet sounds. Life without its pleasures would be a hard thing to endure, but, as physicians, we should not shut our eyes to the misuse of even excellent things when it concerns our bodily salvation.

CORRESPONDENCE.

The Association and the Colleges.

TRENTON, TENN., Sept. 12, 1898.

To the Editor:—I have before me Dr. D. S. Reynolds' reply to my note on page 547 of the JOURNAL. When I presided over the ASSOCIATION in Denver, I acted *then* in my official capacity; *now* I am only a member of the AMERICAN MEDICAL ASSOCIATION, and as such have a right to criticise any of its actions. In the hurry of business, a presiding officer puts such motions as are made, if they are not plainly out of order, when no point of order is made against them, just as was done in the resolutions offered by Dr. Hare in regard to the admission of the members from the State of New York, who were not in affiliation with the recognized Society in that State. The question was discussed at some length before the point of order was made against it that it was out of order because it involved a change in our Constitution in regard to membership. The chair at once ruled the question out of order, and no appeal was taken. A legislative body frequently passes an unconstitutional act, and it is so declared by our courts of last resort. The "Court of Last Resort" in the AMERICAN MEDICAL ASSOCIATION is the ASSOCIATION itself, and the fact that a matter has been adopted, even by a vote in which there were no negative votes cast, does not make it legal. I do not plead ignorance of law. Those who know me best know that I *never* make that plea. It is the *knowledge* of law that I am pleading, and that very fact has induced me to call up this matter. Any one at all posted on law knows that no by-law can be passed which contravenes the constitution or charter which it interprets. All by-laws, or if Dr. Dudley prefers the expression, ordinances, must conform to the charter or constitution, or they are unconstitutional, and hence not binding. An unconstitutional act can not be enforced. The constitution alone can fix the qualifications for membership, and any attempt to change this qualification is an attempt to alter or amend the constitution, and must be treated as such. To amend our constitution, only one way or method of procedure is laid down, and that is found on page 9, section 7, "Provision for Amendment," already mentioned in my first communication. The specifications to which Dr. Dudley refers in the by-laws conform to the constitution of the AMERICAN MEDICAL ASSOCIATION, but this new action of the ASSOCIATION at Denver in regard to the colleges, goes beyond the requirements of the constitution for membership and hence is void.

There can be no "technical quibble about attempting to make the resolution appear as an amendment to the constitution." It is either an effort to amend, or it is not. There is nothing "technical," nor is there any quibble. It is a straightforward presentation of the facts in the case. It is certainly in the province of the ASSOCIATION to fix any requirements for membership it may see fit, but this must be done in a legal way. The object of the constitution in requiring one year's notice of such proposed amendments is too plain. It is to give notice to all interested in the matter, so that "the unexpected" may not happen.

Dr. Dudley is unfortunate in his reference to the law in regard to amending the by-laws. The order of business is a by-law itself, and the provision, to which reference is made, only relates to that one special by-law providing for changes in the order of business so as to allow the ASSOCIATION by a three-fourths vote to take up any special item and consider it, regardless of the order of the call. This provision is as it should be, because without it unfinished and miscellaneous business (Sec. 15) might never be reached. As to the standard of qualifications for the practice of medicine, each State is regulating that, and a diploma of a college demanding five courses would have no more weight than would one issued by a college requiring two or three courses only. With that the ASSOCIATION has nothing to do. The ASSOCIATION has a right to fix, and can fix in a *legal* way a standard for admission into the membership of the AMERICAN MEDICAL ASSOCIATION, but it can not say what "can be accepted of any candidate for admission to the regular medical profession of the United States." The code of ethics governs admissions into the ranks of the regular medical profession.

I do not propose to be drawn into a discussion in regard to the number of terms that may be necessary for students to acquire a sufficient amount of medical lore to enable them understandingly to begin the practice of medicine. It can be summed up in one sentence: Some who attend medical schools *never* learn enough.

I am not a college professor, nor am I related by "affinity or consanguinity" to any one connected with a medical college, and hence what I say or do in this matter can not be due to college bias.

T. J. HAPPEL, M.D.

The Medical College Resolution.

NASHVILLE, TENN., Sept. 12, 1898.

To the Editor:—In a communication from Dr. Happel, which recently appeared in the JOURNAL, I learn that he was misled by a statement made by the Secretary of the Business Committee, when he reported on the medical college resolution. Dr. Bulkley had no authority to state that the Southern Medical College Association, through one of its members, had given assent to the resolution. I was the member referred to and certainly did not say anything that would justify the statement made by Dr. Bulkley. I did appear before a sub-committee of the Executive Committee, as did also Dr. Dudley Reynolds, a member of the Judicial Council of the American

College Association. I stated to the committee that the Southern College Association would take final action at its next annual meeting, which would be held in Memphis in November next, on an amendment to the constitution looking to the establishment of a four years' graded course. I further stated that I had no reason to believe otherwise, than that this action would result in the establishment of the four years' graded course, thus placing the Southern colleges on the same plane with the colleges of the American College Association. I argued that those students who had matriculated in our various colleges, prior to this change in the constitution would be entitled to graduate at the end of three years, and asked that the resolution be modified so as to allow our colleges this privilege. The sub-committee would not listen to so long an extension of time. Finally the conclusion was reached that the class of 1898-99 could be graduated at the end of the third year, and not affect the membership in the AMERICAN MEDICAL ASSOCIATION of individuals connected with these colleges. I saw that this was the best that could be done, and then it was that I said: "If, in your report, you make it appear that the Southern colleges are not being driven in this matter I will not fight the resolution: but if you do not make it so appear then I will be forced, in the interest of the Southern Medical College Association to do my best toward defeating the resolution." I was present when the Executive Committee made its report, through its Secretary, and was surprised as to the manner in which the report was made; but seeing that the intention of the Secretary was to show that the Southern colleges were not being driven, to comply with my promise not to fight the resolution, I said nothing.

Up to this time it had not occurred to me, and it seems that it had not occurred to any one else, that the whole thing was out of order, or I should have raised that point, which, if sustained by the presiding officer, would have delayed final action for one year.

Dr. Reynolds' reply to Dr. Happel's communication is beyond all doubt incorrect. So vital a thing as the question of membership of an organization would not fail to be included in the constitution of such an organization. The matter of "membership" and "rules of order" are very different things; the latter always being in the by-laws, the former always in the constitution. By-laws, and resolutions not intended as law at all, when in conflict with the constitution of any organization, would certainly be null and void. An amendment to the constitution of any organization should never be rushed rapidly through to final action. Hence the very important feature of all constitutions is that they can not be changed without some due consideration, and after an interval of time longer or shorter. Such an amendment must always refer to the article and to the section to be amended.

Dr. Reynolds ought to know, and I presume he does, that Dr. Happel's statement touching the unconstitutional nature of the resolution, could have only the force of a non-official member of the body, but that the opinion expressed by Dr. Happel is correct, no one who is unprejudiced in this matter can doubt. The Judicial Council is the body to which this resolution will have to be referred at the next annual meeting. If this Council finds the resolution to conflict with the constitution of the AMERICAN MEDICAL ASSOCIATION, their decision can be but one thing, and that is that the resolution is null and void.

With the present feeling in the ASSOCIATION there could be no doubt but that an amendment to the constitution, similar to the resolution that was passed in Denver, will be introduced in proper form, at the next meeting, and that it will be finally acted on favorably, at the annual meeting in 1900: in the meantime the colleges constituting the Southern College Association will have carried out their original intention of extending he course of medical instruction to four years. The amendment was introduced two years ago, and would have been acted on finally at the annual meeting in May 1897, except for a request from Tulane University (whose delegate was unable to attend because of the flood) that final action be deferred until the next meeting.

G. C. SAVAGE.

A Case in Obstetrics.

SIOUX FALLS, S. D., Sept. 10, 1898.

To the Editor:—On responding to a call in the country, July 24, to attend Mrs. S. in confinement, I found myself confronted with complications different from anything I had ever before encountered.

I reached the home of my patient, about seven miles from town, about noon. She was a large, muscular woman about 42 years of age, living with her second husband. She had given birth to ten children by her first husband, the oldest now 19 years of age. She had also had three miscarriages, one since living with her present husband.

I found her in bed, lying partially on her right side, with head and shoulders raised by pillows and her lower extremities elevated, because of a violent hemorrhage which had taken place. She was sweating profusely, was very cyanotic, with painful dyspnea; was coughing incessantly, raising enormous quantities of thick, tenacious mucous of a pinkish tint. Pulse 120 and irregular. Inspection revealed a very large abdomen, with very lax walls, so that the uterus and contents would roll from side to side, as she turned. There was complete inertia of the uterus; it seemed large enough to contain twice its contents. A digital examination brought on a profuse discharge of dark, stale, foul-smelling clots. I was unable per vaginam to make out the presentation, but by external manipulation decided it to be a breech. I had never before found a fetus so movable in-utero; it slipped about so freely that I would sometimes find the breech and sometimes the head presenting, perplexing me not a little. I could make out no fetal heart-sounds, so decided we had a dead fetus to deliver, though the mother insisted motion had continued up to that time and that she could still feel it. On close questioning, she admitted that up to just four weeks previously movements had been strong, painful and annoying, but for the past four weeks had been slow and gentle. Knowing that a dead fetus will roll about enough to simulate motion, I thought nothing of this. She stated that about 2 o'clock, A.M., she had felt a desire to urinate and got up upon the chamber, when the membranes ruptured and nearly filled the vessel with a very dark brownish liquid. A neighboring midwife was sent for, who on her arrival became alarmed at the large quantity of dark, foul-smelling clots that were coming away, recommended that a doctor be sent for. Any attempt to manipulate the uterus to excite contraction, or to introduce my hand into the vagina, would greatly aggravate the cough and dyspnea. Patient appeared much alarmed, complained of the dyspnea and said she felt as though her lungs were filled up "clear to the palate." Loud mucous râles could be heard all over the chest. Not deeming it safe to administer an anesthetic, I gave her a teaspoonful of ergot, together with $\frac{1}{4}$ grain of extract of belladonna, $\frac{1}{4}$ grain of codein, and six drops of chloroform. In an hour I gave her half a teaspoonful of ergot and repeated the belladonna and chloroform, omitting the codein. The cough and expectoration subsided, the dyspnea disappeared, hemorrhage stopped and pulse came down to 100. Within an hour after the second dose she was able to turn upon her right side and, with pillows removed, rest quietly. Previously she had been unable to lie either upon her right side or back. The uterus began to contract feebly, but regularly, though any attempt at manipulation would bring on the cough and dyspnea. I then administered a three-grain pill of ergotin and a two-grain of quinin and awaited developments. Pains grew more frequent and regular until about 11 P.M., when they became strong and natural.

Introducing two fingers into the vagina, I now succeeded in hooking into the groin of the fetus and delivering it promptly. It had the appearance of being somewhat immature and of having been dead a long time. The secundines were delivered in the usual manner in about twenty minutes.

My attention was attracted to the extreme length of the cord. Upon examination, I found a large, firm knot near the center, revealing the cause of the death of the child. It was not simply a single knot, but a complete figure 8. The cord had apparently become looped, twisted once upon itself and the loop had passed completely over the fetus and been drawn tight, shutting off the circulation. Untying the knot and measuring the cord I found it to be *forty-seven* inches long, by careful measurement. Forty inches is the longest I had ever before found. After the removal of the placenta and clots the uterus contracted normally and the patient felt relieved of all her distressing symptoms.

My theory, which may not be correct, is that after the cord became tied the placenta was detached and hemorrhage took place, distending the uterus abnormally, finally being limited and controlled by the size of the uterus, and for some reason it could not escape from the os, the clots remaining in utero until after the rupture of the membranes, when they were allowed to escape. The cough, with profuse expectoration, the dyspnea, cyanosis, perspiration and high pulse were, I believe, due to absorption of toxic material from within the uterus. I report the case, hoping it may be as interesting and instructive to some of the readers of the JOURNAL as it has been to the writer.

A. H. TUFTS, M.D.

Braces in Spinal Curvature.

CHICAGO, Sept. 12, 1898.

To the Editor:—In the JOURNAL of Sept. 10, 1898, there appears an editorial entitled "Braces in Spinal Curvature" which contains so many half truths, to put it gently, that it should not pass without comment.

The editorial writer says: "The two conditions of tubercular caries and spinal curvature differ so widely in their causation, symptomatology and treatment that each must have a clear-cut picture in our mind when examining soinal caries." This is true in so far as causation and treatment go, but it is not true in all cases in so far as symptomatology is concerned. It is true that there are cases that distinctly differ, and there are other cases where those having the greatest experience can not at once differentiate. Lateral spinal curvature may not simulate tubercular caries, indeed there would be no serious harm done to the patient by the treatment if it did, but tubercular caries in the early stage, before the characteristic posterior deformity has developed, may simulate spinal curvature so closely that a certain diagnosis can not be made by any one on the first examination. This is a serious matter, for tubercular caries will be seriously aggravated if it be treated for spinal curvature. In all cases of doubt the benefit of the doubt should be given to tubercular caries, and the case treated by some efficient form of immobilizing apparatus.

Now as to symptoms: A reflex rigidity of the spine is the only constant symptom in tubercular caries. Pain is rarely present until months after a diagnosis should have been made, and in many cases it is never complained of during the entire course of the disease. Pain on motion is rarely present except when the patient is caught off his guard. The involuntary muscular rigidity, above referred to, protects the spine from motion, which otherwise would be painful. It is a very fatal error to regard pain as a constant symptom in tubercular caries of the spine or of other bones. I have reported a case of hip disease that passed to a flexion deformity of ninety degrees and absolute loss of motion, then through a complete reduction of the deformity by a leverage brace, through the development and spontaneous evacuation of two large abscesses, and finally to recovery with good motion at the end of six years, that never had a minute's pain or tenderness, and was all the time able to walk on the leg and also to stand on it alone, and holding up the well leg, hop about without the slightest sensitiveness. "Angular deformity in an anteroposterior plane" is a comparatively late symptom; he who can not make a certain diagnosis long before the development of "angular deformity in an antero-posterior plane," is very ill-fitted to treat a case of tubercular caries of the spine. Lateral deformity, simulating lateral curvature, is an early symptom in nearly half of the cases. Abscesses appear in less than half of the cases, and paralysis, fortunately, is very rare. These should be counted as complications and not as symptoms of tubercular spinal caries. If the diagnosis is made early, tubercular caries of the spine will be found in well-nourished as often as in ill-nourished children; it is only when it has remained unrecognized for months, perhaps until pain is complained of and angular deformity has developed, that the children nearly all become poorly nourished.

As to lateral curvature of the spine: It has not been demonstrated by any one that the predisposing causes are prolonged ill health or rapid growth. As a rule these cases have not grown rapidly, they are undersized, and have never had any special ill health, prolonged or otherwise. It is true that it is usually noticed by the dressmaker, between the ages of twelve and twenty years, but it can be found, if looked for, many years earlier, as shown by Ketch of New York. No one has shown any hypertrophy in the muscles of either side; if it were on either side it could not be on the side of the convexity, as claimed by your editorial writer, and further, it has been clearly proven by Scudder, of Boston, that there is no muscular hypertrophy, or atrophy, or muscular weakness, or difference in the strength of the muscles of the two sides in the ordinary cases of lateral spinal curvature. A tilted pelvis arises from a short leg, and one short leg is found in sixty per cent. of children who have no lateral curvature, as was long ago shown by Morton, of Philadelphia. When there is a short leg and a tilted pelvis in conjunction with lateral curvature it is found quite as often on the wrong side as on the right side. That is to say, with a right dorsal and left lumbar curvature the pelvis should be oblique, the right side high and the left low, and the left leg shorter than the right. Quite as often as otherwise the right leg is half an inch shorter than the left, as reported by me many years ago, and since confirmed by many observers. A word as to the treatment: In slight cases, especially in postural cases, "apparatus," that is, braces and corsets, is not necessary. In cases where there is any of what Roth calls "osseous deformity" "apparatus" is necessary if reduction of deformity is to be gained, and often, if the progress of the deformity is to be checked, but the "apparatus" should always be used in conjunction with exercises given by the surgeon himself.

Respectfully yours,

JOHN RIDLON.

American Public Health Association—Twenty-Sixth Annual Meeting.

CHICAGO, Sept. 12, 1898.

To the Editor:—The forthcoming meeting of this Association is an international one, inasmuch as it will convene at Ottawa, Canada, Sept. 27 next, and as such promises to be of much interest, because representatives, not only from the United States, but from Mexico and Canada will be present.

As this Association has been known in the past for its marked energy in successfully promulgating Municipal, State, National and International sanitary matters, its influence in disseminating the practical application of public hygiene, not only to the medical profession of the countries named, but to the public generally will be wide. It appears to the writer that at this particular time our profession should be largely represented at this international meeting of sanitarians. It is

well-known that all the wisdom of sanitary science is not contained in a few hundred of the members of this or any other large body, but there are other important reasons why this meeting should be a representative one in numbers, namely: among the special committees provided for in its constitution, is the Committee of Public Health Legislation, and it is expected that this committee will submit a comprehensive report, on the merits of which a full discussion should be participated in by medical men.

The convening of Congress at Washington, next winter, will be awaited with renewed interest, as many important topics of a judicial and commercial nature will be introduced, of which none are more important than public health matters. With the strong endorsement of the AMERICAN MEDICAL ASSOCIATION, the American Public Health Association, and scores of other scientific societies throughout the United States, our profession should *demand* of Congress that our petition looking toward a Department of Health be granted—a department that will be an ideal one from which any country throughout the universe might model.

As the medical profession and citizens of the beautiful and picturesque capital city of the Dominion of Canada have invited this Association and its friends to be their guests at this meeting, it is hoped that a large representation of our profession can attend. Several entertainments have been provided for. Those of us who have shared their hospitality on similar occasions know the social functions extended to us, and their unbounded hospitality is proverbial. For this occasion complimentary excursions, luncheons, etc., have been announced on the program, and the ladies who will grace the gathering will be provided for in a charming manner.

The usual rate of a *fare and a third* has been granted by the railroads: tickets issued on the certificate plan. It is proposed to leave Chicago on Sunday, September 25, at 3:15 P.M., via the Wabash and C. P. R. The magnificent sleepers of the Canadian Pacific will run through from Chicago to Ottawa without change. It is expected that the Mexican delegates will go this way, thus accompanying those who pass through and depart from Chicago. The train leaving Chicago at 3:15 P.M., is due to arrive at Detroit at 10:45 P.M. on Sunday, when we will be joined by other members of the Association, who will accompany us the remainder of our journey. Leaving Detroit at 11:35 P.M., we are due at Toronto on Monday morning the 26th, and at Ottawa at 5 P.M. the same day.

Believing that this international meeting will be an unusually profitable one, scientifically, and that a large attendance is particularly desirable, is why the writer has invoked space in our JOURNAL for this communication.

Very sincerely yours,

LISTON H. MONTGOMERY.

PUBLIC HEALTH.

Society for the "Repression" of Tuberculosis.—A well-attended meeting of prominent members of the profession took place recently, by invitation, at the house of Sir William Broadbent. The meeting had been called to consider the advisability of inaugurating a movement to disseminate knowledge concerning tuberculosis and its prevention, and also the provision of sanatoria for the open-air treatment of tuberculous lung disease. Sir William Broadbent was in the chair, and he briefly stated the objects in view. He read a letter from the President of the Royal College of Physicians of London, expressing approval of the project and suggesting lines of work. Dr. Corfield, Mr. Malcolm Morris, Mr. Shirley Murphy, Dr. Isambard Owen, Dr. J. Pollock, Dr. Ransome, Dr. H. Weber and others spoke; and resolutions were passed: 1, expressing the desirability of forming a public association for the purpose stated, and 2, appointing a provisional committee to take the necessary steps to start such an association. We heartily sympathize with any action which may be taken to diminish the amount of tuberculous disease, and consider that if, as no doubt will be case, the methods of effecting this are pursued with wisdom and discretion, much good will be done. The facts, as stated by Dr. Ransome, that under existing sanitary legislation the death-rate from such disease has been reduced by two-thirds, and, as Mr. Shirley Murphy pointed out, that vast improvements have taken place in London habitations during the past twenty years, go far to encourage the hope that yet greater benefits will accrue when the community realize fully the preventable nature of tuberculosis and the value of pure air and food.—London *Lancet*.

Phosphorus Poisoning in France.—The prevalence of this formerly serious evil has been much reduced since the French government assumed the monopoly of match-manufacture, and framed rules that must be read aloud to the work people at the factories, at least once every month. Among these rules, according to the London *Lancet* for August 6, is one that enjoins that no food or drink shall be allowed in the workshop, but must be left in the dining-room; that before meals the working clothes must be left in the cloak-room, and the work people must wash their hands with soft soap and water, and must gargle their mouths with a gargle specially provided for that purpose. Then only are they allowed to eat. The same precautions are taken on their leaving the works. Further, it is enacted that no one shall be employed under sixteen years of age, and that they must first be examined by the medical man, who must certify that they are free from bodily infirmity and contagious disease; that they have been vaccinated or have had smallpox, and that the state of the teeth is good. As a result of these precautions among the 575 men and women employed at the Pantin and Aubervilliers works there has not been a single case of phosphorus poisoning during the year 1897. A reduction in the severer cases has been chiefly due to raising the age of admission, to medical examination, subsequent close supervision, repeated dental examination, the personal cleanliness of the workers, and immediate suspension on first symptoms of illness, with allowance of two-thirds of the salary while the employé is away from the works. The French government is doing all in its power to discover better methods of manufacture. Chemists and inventors are paid out of the public purse to study the matter, and the result is, that a match which will strike anywhere and yet which is free from phosphorus has been invented, though it has not yet become a commercial article.

Milk Supervision by Municipal Sanitary Boards.—Dr. W. H. Hatch has reported in the *Journal of Comparative Medicine*, some of the good results of local milk-work in the city of Buffalo, N. Y.

In the absence of State supervision it would seem pertinent to here refer to the system adopted by the Health Commissioner of Buffalo, with the view of mitigating, if possible, the contamination mentioned. By his direction a record of the various dairies supplying the city is kept. This includes inquiry: 1, as to the herds, their health, and whether they are subjected to veterinary examination and tuberculin-test; 2, the methods of cleaning utensils, the process and time given for cooling the milk, hour of shipment, and distance hauled; 3, quality and source of the water supply; 4, physical condition of the employes, etc.; 5, educational efforts in the way of causing the dissemination of literature bearing upon the interest of the dairyman and his care of the milk.

Following this, where conditions at the dairy are deleterious or where circumstances arise of a character deemed prejudicial to the public health, instant investigation by the health department is made, and the dairyman required to correct, without delay, such conditions as may be at fault. Failing to

do which, or even prior to notification, if urgency and facts demand it, the product of such dairy is interdicted at the city line; the milk-house in the city to which the milk is consigned being at the same time notified and prohibited from receiving the milk, under penalty of the revocation of license. Under this system, the only one available under the circumstances, it is believed that decided sanitary improvement has been made in the dairies supplying Buffalo, the ratio of infection diminished, and a corresponding influence made upon the public health. Many dealers keep milk only as a convenience to their customers. Their facilities for proper storing and handling are insufficient—in fact, nothing. This traffic in milk is objectionable from the fact that it is only a small part of the business, and subsidiary to other interests. The average storekeeper has little or no information relating to milk, which, while in the store, is not only liable to absorb deleterious odors from adjacent products, from vegetables, perchance decomposing, but more seriously to contamination by micro-organisms, from dust and dirt which are tracked in from the street by the feet of customers and blown about the store by the draughts. This condition is always present and a danger, and is invited by the habit of leaving the milk-cans uncovered. Grocers and other small dealers should be and are obliged, in Buffalo, to keep posted in a conspicuous place the names and license of those from whom they obtain their milk. To abolish this store peddling will be difficult, but existing conditions should be mitigated by personal instruction to the dealers and frequent inspection by those designated for that duty. Adulteration of milk by water or contamination by preservatives may be considered of secondary importance to the question of sanitation. Stringent ordinances relating to both are proper. Concerning the former, the use of the lactometer as a method of testing has given rise to much discussion through the possibility of evasion at the hands of crafty and unscrupulous dealers. State and city laws upon this feature are too liberal, placing the standing as low as it has been deemed possible for normal milk to assume under ordinary conditions. Adulteration of milk by water is not a common occurrence in Buffalo, and is seldom found among representative dealers. It is in the main confined to peddlers, who, having an unusual and unexpected demand, resort to the Buffalo water-supply for assistance. The peddling of milk in the streets as well as the distribution of milk through grocery stores and small dealers should properly be abandoned. The yearly license system, with power of revocation and with heavy penalties for violating ordinances relating to the business, and with further penalty of exclusion from the trade after a certain number of offences, should be adopted. The features here specified are necessitated by the fact that in all municipalities the evils they endeavor to cover and prevent have been found to exist, and through their existence contamination has occurred, and disease has been definitely assigned to to them. Almost all these directions are, through the direction of Health Commissioner Wende, embodied in the ordinances of the City of Buffalo, and enforced without favor. They have been found efficient, and the security they have given to milk has been demonstrated by the low rate of infantile mortality through diseases known to be due to milk.

Anaerobic Bacterial Purification of Sewage.—In the *British Medical Journal*, Dr. Boyce directs the attention of sanitarians to some early attempts at the bacterial treatment of refuse, in part as follows: "The most recent advance in the treatment of sewage was subjecting it to aërobic fermentation. This now seems likely to be reinforced by an anaërobic method, and one which may play a most important part in the solution of a very difficult and costly problem. I should like, therefore, to direct attention to some early work upon the subject which, as far as I am aware, appears to have been overlooked. In January, 1893, my father received a very interesting letter from the British Consul at Barcelona, bringing to his notice a new method for the treatment of sewage, a method which the writer stated had been published in France about the year 1883 by the Abbè Moigno. The Consul stated that the system had been tried by a well-known merchant of Barcelona, at first at his factory and then at his private residence, and that at the time of writing the method had been in operation for five years with perfect success. The Consul had himself inspected the tank and had seen the almost colorless and odorless fluid which came away, and which was removed in casks and employed for manure purposes without causing the slightest repugnance. 'By a mysterious action which reveals an entirely new principle it transforms all that it receives, both solid and liquid evacuations, in a tolerably short time, and without any addition of chemic ingredients into a homogeneous and scarcely turbid liquid, which holds everything in suspension in a state of filaments almost visible, without leaving any deposit against the sides of the soil-pipe or at the bottom of the drain-pipe.' The apparatus is constantly discharging, and the fluid is admirable for domestic irrigation. The septic tank is then accurately described and figured, and the capacity calculated for the amount of work it has to do. It is in effect the perfect septic tank as now understood. The Abbè discusses the theory of action of the complete decomposition of the fecal and refuse material in the airless tank, and hints that it may be due to the action of a hydrosulphate of ammonia, but he adds that this is a conjecture, and proceeds, 'May it not be discovered that the mysterious agents of the fermentation, cause of the decomposition and liquefaction of the feces are the vibrios, or rather the anaërobes of M. Pasteur, which the oxygen kills, and which only employ their devouring activity when excluded from the air?' A laboratory septic tank was constructed with glass sides, so that the whole process of fermentation and liquefaction could be observed, the layer of about 5 c.c., which forms upon the surface is described and the manner in which it undergoes disintegration. A tap was placed on the top of the tank and over this a bladder was securely fastened, and it was found that little, if any, distention of the bladder occurred. If, however, air was admitted to the tank there was a rapid development of gas bubbles and soon the bladder was distended, and therefore for the effective working of the bacterial destructor it was essential to exclude the air. He points out that a certain proportion of water is requisite to prevent saturation of the fluid with the product of decomposition, and in consequence arrest of the process. Chemic analysis of the fluid showed that it possessed strong fertilizing properties. The Abbè conjectures that during the petrid anaërobic fermentation any pathogenic germs which might be present are destroyed, and that therefore the fluid can be turned with impunity into the sewers or used for irrigation."

BOOK NOTICES.

An American Text-book of Gynecology, Medical and Surgical, for Practitioners and Students. By HENRY T. BYFORD, M.D., J. M. BALDY, M.D., EDWIN B. CRAGIN, M.D., J. H. ETHERIDGE, M.D., WILLIAM GOODELL, M.D., HOWARD KELLY, M.D., FLORIAN KRUG, M.D., E. E. MONTGOMERY, M.D., WILLIAM R. PRYOR, M.D., GEORGE M. TUTTLE, M.D. Edited by J. M. BALDY, M.D. Second edition, revised, illustrated. Pp. 718. Philadelphia: W. B. Saunders, 1898. Price, cloth, $6; sheep or half morocco, $7. For sale by subscription.

Our notice of the first edition of this work will be found in Vol. xxii, p. 62, Jan. 13, 1894, in which we gave a favorable notice of the work. In this edition we are informed by the editor that more than forty of the old illustrations have been replaced by new ones, and that very much of the material has been altered and rearranged. The portions devoted to plastic work are practically new. The article on hysterectomy has

been rewritten and more fully illustrated. The book has been revised, so that it fairly covers the changes and improvements which have been made in the art during the four years which have elapsed since the publication of the first edition. The style of the work is excellent, the publisher having spared no pains to secure the finest typographic effect. Some of the illustrations are beautiful.

A Text-Book Upon Pathogenic Bacteria for Students of Medicine and Physicians. By JOSEPH MCFARLAND, Professor of Pathology in the Medico-Chirurgical College. With 134 illustrations. Pp. 497. Second edition, revised and enlarged. Philadelphia: W. B. Saunders. 1898. Price, $2.50 net.

Our notice of the first edition of this work will be found in Vol. xxvi, page 688, April 4, 1896, and we regret to see that the errors in history which were pointed out in our notice have still been continued in the present edition, no correction having been made. In other respects, the volume sustains the favorable opinion we gave of it on its first appearance. In this edition new chapters have been added, dealing with the bacteriology of whooping-cough, mumps, yellow fever, hog cholera-swine plague, describing bacillus aërogenes capsulatus and proteus vulgaris, and pointing out the methods of determining the value of antiseptics and germicides, and of determining the thermal death-point. This makes a work fully abreast of the times, and one of the most useful of recent text-books on bacteriology, so far as its practical applications are concerned.

Onzieme Congres de Chirurgie, Paris, 1897; Association Française de Chirurgie, Procès-Verbaux, Mémoires et Discussions. Publiés sous la direction De M. Le Dr. LUCIEN PICQUÉ, Secrétaire-Général. 8vo. Pp. 960, with numerous engravings. Paris: Félix Alcan. Price 20 f.

This work comprises the transactions, papers and discussions of the Eleventh Congress of Surgery, held at Paris in October last by the Association Française de Chirurgie. The questions which were discussed at this session were, first, "Contusions of the Abdomen," and, second, "The Indications for Operation and Treatment of Cancer of the Rectum." In addition to the numerous communications and discussions which belonged to the program there were also many volunteer papers presented by the members of the congress on interesting surgical cases. An examination of the volume shows conclusively that, from the standpoint of efficient surgery, the French surgeon still keeps on as high a plane as other leading surgeons of the world.

The Twelfth Congress will be held at Paris by the Faculté de Médecine on Monday, Oct. 17, 1898, under the presidency of Prof. Le Dentu.

An American Text-book of the Diseases of Children; Including Special Chapters on Essentially Surgical Subjects—Orthopedics; Diseases of the Eye, Ear, Nose and Throat; Diseases of the Skin; and on the Diet, Hygiene and General Management of Children, by American Teachers. Edited by LOUIS STARR, M.D., assisted by THOMPSON S. WESCOTT, M.D. Second edition, revised. Pp. 1244. Philadelphia: W. B. Saunders, 1898. Cloth, $7; half morocco, $8; sale by subscription only.

There are sixty-eight contributors to this volume. The contents of the volume are, in general, as follows: First, an Introduction of 60 pages; next, Part I, disorders incident to birth and diseases of the newborn, 68 pages; Part II, diathetic diseases; Part III, infectious diseases; Part IV, general diseases not infectious; Part V, diseases of the blood; Part VI, diseases of the digestive organs; Part VII, diseases of the nervous system; Part VIII, diseases of the respiratory system; Part IX, diseases of the heart; Part X, diseases of the genito-urinary system; Part XI, orthopedics; Part XII, diseases of the skin; Part XIII, diseases of the ear; Part XIV, diseases of the eye.

The first edition of this book was noticed in this JOURNAL in Vol. xxii, p. 641, April 28, 1894. Some new articles have been added to the present edition, some of the original papers have been amended, and a number have been rewritten. The new articles include modified milk and percentage milk mixtures and orthopedics. Those rewritten are typhoid fever, rubella, chicken-pox, tuberculosis, meningitis, hydrocephalus and scurvy, while extensive revision has been made in the chapters on infant feeding, measles, diphiheria and cretinism. The volume has therefore been increased in size by about fifty pages.

The editor records with regret the decease of two of his collaborators who wrote articles in the previous volume, and which have been continued in this—Drs. Charles Warrington Earle of Chicago, and J. Lewis Smith of New York.

In most respects, the work is quite up-to-date, but we notice that the old weights and measures continue to be used in the formulæ, to the exclusion of the decimal system. So progressive a book should not be "behind the procession" in this respect.

A Clinical Text-Book of Medical Diagnosis for Physicians and Students, Based on the Most Recent Methods of Examination. By OSWALD VIERORDT, M.D., Professor of Medicine of the University of Heidelberg. Authorized translation, with additions by Francis H. Stewart, A.M., M.D. Fourth American Edition from the Fifth German. Revised and enlarged. 194 illustrations. Pp. 603. Philadelphia: W. B. Saunders. 1898. Price, cloth, $4 net: sheep or half morocco, $5.

This favorite work needs no syndicate of professors to insure its sale at medical colleges. Although less than nine years elapsed between the date of the first edition and the date of the fifth, from which the present translation is made, the book has been kept carefully abreast of the progress of the times. The author himself has carefully revised his work four times. With the exception of the entire omission of the Roentgen ray, all the latest methods of diagnosis have been incorporated in this volume. This has been done purposely, as its distinguished author states that for purposes of internal medicine the application of the Roentgen ray is still in the beginning. It is quite possible that before another edition shall have been issued, its place in internal medicine will be more definitely fixed. In the meantime, this work remains, as before, one of the most valuable books of its class.

Transactions of the American Surgical Association. Volume xvi. Edited by DE FORREST WILLARD, A.M., M.D., Ph.D., Recorder of the Association. Pp. 319. Printed for the Association. Philadelphia, 1898. For sale by William J. Dornan.

The contents of this volume include the list of the officers, presidents, fellows and honorary fellows of the Association, the constitution and by-laws, an account of the D. Hayes Agnew Memorial Wing of the University Hospital at Philadelphia, the address of welcome by Dr. Joseph Holt of New Orleans, the address of the President, and papers as follow: "Etiology and Classification of Cystitis," by N. Senn, M.D.; "The Question of Operative Interference in Recent Simple Fractures of the Patella," by Charles A. Powers, M.D.; "The Use of Animal Toxins in the Treatment of Inoperable Malignant Tumors," by George Ryerson Fowler, M.D.; "A Clinical and Histologic Study of Certain Adenocarcinomata of the Breast, with a Brief Consideration of the Supraclavicular Operation and the Results of Operations for Cancer of the Breast, from 1889 to 1898, at the Johns Hopkins Hospital," by William S. Halsted, M.D.; "An Inquiry into the Etiology of Cancer, with some Reference to the Latest Investigations of the Italian Pathologists," by Roswell Park, M.D.; "Remedial Measures in Obstruction of the Common Bile-duct," by J. McFadden Gaston, M.D.; "Traumatic Rupture of Pancreas, Formation of Hemorrhagic Cyst; Operation; Pancreatic Fistula; Recovery," by H. W. Cushing, M.D.; "The Cranial Cracked-pot Sound as a Symptom of Cerebellar Tumors," by N. B. Carson, M.D.; "A Case of Appendicitis in which the Appendix became Permanently Soldered to the Bladder, like a third Ureter, Producing a Urinary Fecal Fis-

tula," by W. W. Keen, M.D.; "A Case of Fecal Communication with the Bladder, with Resulting Calculus Following Appendicitis," by George Ryerson Fowler, M.D.; "Gunshot Injuries of the Spine," by T. F. Prewitt, M.D; "Hysteria from a Surgical Standpoint," by James E. Moore, M.D.; "Hypertrophy of the Prostate Gland, and Suggestions in Regard to its Treatment," by L. C. Lane, M.D.; "Some Cases not Operable," by David W. Cheever, M.D.; "A Case of Apparently Hopeless Infiltration of Left Axilla and Scapula by Round celled Sarcoma; Extirpation Attempted and Abandoned; Extensive and Severe Wound Infection Followed by Disappearance of the Tumor," by Maurice H. Richardson, M.D.

In this volume will be found a valuable paper on the etiology and classification of cystitis and a paper on fractures of the patella. The surgeon who owns a complete set of the transactions of the American Surgical Association will have at his disposal one of the best exponents of American surgery that can be found in our literature, and he will have occasion to observe that the topics and discussions each year usually contain information in advance of the text-books.

A Text-Book of Materia Medica, Therapeutics and Pharmacology.—By GEORGE FRANK BUTLER, Ph.G., M.D., etc. Second edition, revised. Pp. 860. Philadelphia: W. B. Saunders, 1898. Price, cloth, $4 net; sheep or half morocco, $5.

In our first notice of this book, in Vol. xxvii, p. 1117, Nov. 21, 1896, we expressed the opinion that it had certain features that would make it very popular—such as designating the precise orthoëpy of all the names according to the Romanesque pronunciation, the use of the decimal system throughout, and having conveniently placed the genitive form after each official name. These features are bound to be of use to students, and we are not surprised that the second edition was called for so quickly. The work has been thoroughly revised, and, as we said before, "taken as a whole the book may fairly be considered as one of the most satisfactory of any single volume work on materia medica on the market."

Report of the Twelfth Annual Meeting of the Association of the Executive Health Officers of Ontario. Paper. Pp. 72. Toronto: Warwick Bros. & Rutter. 1897.

This report contains the proceedings of the meeting held at Toronto, Ont., Aug. 16 and 17, 1897. It is well printed on good paper, and contains much of interest to the physician.

Transactions of the Medical Society of the State of New York. 1898. Cloth. Pp. 512. Published by the Society, 1898.

This volume contains proceedings of the Annual Meeting of the Society held at Albany in January of this year, with data as to delegates, permanent and honorary members, forty-four papers presented at the Society, besides obituary notices of various deceased members of the Society, and a list of the officers of the Society from its organization up to the present time.

Transactions of the Sixty-fifth Annual Session of the Medical Society of the State of Tennessee. Cloth. Pp. 300. Nashville: Jno. Rundle & Son, 1898.

This volume comprises the minutes of the session held at Jackson, Tenn., April 12, 13 and 14, 1898, a list of the delegates to the AMERICAN MEDICAL ASSOCIATION, committees, judicial council, By-laws, "Code of Ethics," and the various papers presented before the Society, with the discussions thereon.

PAMPHLETS RECEIVED.

Aberrant Tendinous Cords of the Heart. By Henry F. Lewis, Chicago. Reprinted from Phil. Med. Jour.

American Climatological Association.

Blood Serum as an Antiseptic and Surgical Dressing with Report of Cases. By Charles Graefe, Sandusky, Ohio. Reprinted from Lancet Clinic.

Cystic Degeneration of the Chorion Villi with Co-incident Cystic Tumor of Both Ovaries. By Henry Kreutzmann, San Francisco, Cal. Reprinted from Am. Jour. of Obstet.

Diseases of the Lachrymal Passages: Their Causes and Management. By Leartus Connor, Detroit, Mich. Reprinted from Jour. Am. Med. Ass'n.

Does the Present Method of Teaching by Didactic Lectures Best Qualify the Student for the Practice of his Profession. By John S. Marshall, Chicago. Reprinted from the Dental Review.

Employment of Solutions of Toluidin Blue as Collyria, and as a Stain for Corneal Abrasions and Ulcers; Importance of Early Recognition and Treatment of Acute Inflammatory Glaucoma. By C. A. Veasey, Philadelphia. Reprint.

Infant Feeding. By Luther S. Harvey, Crescent City, Fla. Annals of Gyn. and Ped.

Organization of the British Medical Association. By Surgeon-Col. G. J. H. Evatt, M.D., Hongkong, China. 1898.

Patency of the Stump After Salpingectomy. By J. Wesley Bovee, Washington, D. C. Reprinted from Am. Jour. of Obstet.

Prevention of Diseases now Preying upon the Medical Profession. By Leartus Connor, Detroit, Mich. Reprinted from Bul. of the Am. Acad. of Med.

Proper Use of Vaginal Pessaries. By J. Wesley Bovee, Washington, D. C. Reprinted from Va. Med. Sem.-Mo.

Some New Practical Pharmaceutico-Therapeutic Notes, and Some New Ideas in Surgical Instruments. By Samuel F. Brothers, New York City. Reprinted from Phil. Med. Jour.

Tubo-Ovarian Hemorrhage Resembling Ruptured Ectopic Pregnancy. By J. Wesley Bovee, Washington, D. C. Reprinted from Am. Gyn. and Obstet. Jour.

TRADE PAMPHLETS.

The Alpha Sanitarium, Lake Forest, Ill.

Announcement Chicago Eye, Ear, Nose and Throat College, Chicago, Ill.

Bromidia; Iodia. Battle & Co., St. Louis, Mo.

Guaiaquin. McKesson & Roberts, New York City.

SOCIETY NEWS.

Idaho State Medical Society.—The sixth annual meeting of the Society was held at Moscow, September 6 and 7. The following officers were elected for the ensuing year: President, C. W. Shaff, Lewiston; vice-president, E. F. Guyon, Montpelier; secretary, Edward E. Maxey, Caldwell. The next annual meeting will be held at Lewiston, Sept. 5 and 6, 1899.

Mississippi Valley Medical Association.—The annual meeting of the Association will be held in Nashville, Tenn., October 11, 12, 13 and 14. The provisional program contains seventy-five papers and the members of the Association look forward to an interesting meeting. Communications concerning papers should be sent to Dr. Henry E. Tuley, Louisville.

The Thirteenth International Congress of Medicine.—This Congress will meet in Paris, France, Aug. 2-8, 1900. The section of psychiatry is already organized, with a committee of twenty-five of the best-known alienists of Paris and the provinces, among them Bourneville, Professor Mairet, Paul Garnier, Meuriot, Falret, Vallon and Jules Voisin. Dr. Magnan is president of the section, Professors Joffroy and Ballet vice-presidents and Ant. Ritti of the Maison Nationale of Charenton secretary. The subjects selected are: In mental pathology, "The Psychoses of Puberty"; in pathologic anatomy, "Idiotism"; in therapeutics, "Bed Treatment in Acute forms of Insanity and the Modifications it may Entail in the Organization of Asylums"; in legal medicine, "Fixed and Impulsive Sexual Perversions from a Medico-Legal Point of View." There are to be three addresses on each subject, one by a French "rapporteur" and two by foreigners.

American Academy of Railway Surgeons.—From the preliminary program of the fifth annual meeting, to be held at the rooms of the Chicago Medical Society, Chicago, Oct. 5, 6 and 7, 1898, we note that the executive sessions are open to Fellows only. In the scientific sessions, open to all those interested, the following papers are announced: "Anesthesia," R. H. Cowan, Radford, Va.; "Traumatic Injuries of Peripheral Nerves," D. S. Fairchild, Clinton, Iowa; "Injuries of the Genital Organs," Milton Jay, Chicago; "The Radical Cure of Hernia," W. J. Mayo, Rochester, Minn.; "Concealed Meningeal Hemorrhage," H. Reineking, Sheboygan, Wis.; "Physical Examination for Railway Surgeons," J. F. Pritchard, Manitowoc, Wis.; "The Hygiene of Railway Injuries," G. P. Conn, Concord, N. H.; "Conservatism in Railway Surgery," H. Hatch, Quincy, Ill.; President's Address, "The Higher the Order of Railway Surgery the Greater the Protection to the Employe, the Passenger and the Company," R. Harvey Reed, Rock Springs, Wyo.; "Convenient First Dressing of Fractures with Samples," E. H. Trickler, Cutler, Ohio; "Surgical Treatment of Some Varieties of Disease of the Prostate and Seminal Vesicles," G. E. Benninghoff, Bradford, Pa. The following Fellows of the

Academy have promised papers: A. D. Bevan, Chicago; Allen Staples, Dubuque, Iowa; LeRoy Dibble, Kansas City, Mo.; C. K. Cole, Helena, Mont.; George W. Crile, Cleveland, Ohio. R. HARVEY REED, M.D., President, Rock Springs, Wyo.; D. C. BRYANT, M.D., Secretary, Omaha, Neb.

Virginia Medical Society.—The annual meeting of the Virginia Medical Society was of more than usual interest. It was held August 30 and 31 and September 1, at the famous watering place, Virginia Beach. This is eighteen miles southeast of Norfolk, Va., on the Atlantic coast, and is one of those rare, wide, sand-floor beachs so much enjoyed on the coast. The Princess Anne Hotel was the home and place of meeting, and was an ideal spot for comfort and great pleasure. It was a new feature to see crowds of medical men and their families disporting themselves in the surf night and morning, filling the air with joyous shouts and displaying all the enthusiasm of youth over again. It was a delightful change from the dreary reading of papers to plunge into the surf and feel the force of the Atlantic waves with all their cool freshness. If medical societies could meet on ocean shores in hot weather, both the science and the pleasure would be intensified in many ways. The meeting was very largely attended; thirty-six papers and two addresses were down on the program, all of which was carried out most carefully. The president's address, by Dr. Harvie, was replete with practical advice to the young men of the profession, and the public address by Dr. Jones of Roanoke was interesting. The first session was devoted to papers and discussions on diphtheria and the influence of bacteria in disease, and was spirited in its scientific and free expressions of opinions. Dr. Bolton of Brattleboro, Vt., described the bacteria of typhoid fever and its vitality and transmissibility under different circumstances. All the papers were short and clear. The second session was devoted to surgical papers. Dr. Phelps of New York gave a clinical paper on "Hip Joint Disease," and Dr. Mallet of the Universlty of Virginia gave some very interesting results of experiments on kreatin and kreatinin. At the night session, many gynecologic questions in several papers of ability were presented at some length. Papers covering a great variety of topics were read at the remaining sessions, some of which were followed by able and instructive discussion. The meeting closed with a very pleasant banquet at the Princess Anne. The publication of the papers at an early date indicates a very healthy spirit in the Society, which, while comparatively young in organization is fully equal to many of the larger and more pretentious societies. Most of the members are widely scattered over the mountain and valley towns of the State, more or less difficult of access and isolated from each other; and yet in papers and discussion they show a familiarity with medical science that would compare favorably with that shown by city societies. One thing noticeable is that the Virginia doctor can always express himself clearly in public debate. He may not be well informed on all matters, but what he does know he can put clearly and smoothly in offhand talks. The papers at this meeting were very common-sense, and clear, unpretentious discussions of the most practical side of the topic. Most of the physicians were educated in their own State at the very excellent University of Virginia and the Richmond schools, and a large number have received a classic training before their degree, hence a wider culture is apparent. While the cross-roads doctor and the irregular exist, they are hardly noticeable. The Virginia medical man ranks higher socially than in other States, and this requires general culture and participation in the affairs of the neighborhood calling for judgment on matters outside of medicine. The examining board for admission to practice in the State has a very high standard of requirements, and many persons are rejected at every session. The board has manifested a very strong determination to raise the standard of the profession throughout the State. The State Society is greatly indebted to Dr. Edwards, the secretary, who for years has worked incessantly to gather all the physicians in the State into a popular, enthusiastic society. As nearly all the physicians are general practitioners, doing all sorts of general and special practice, the annual meeting is a postgraduate school to some degree, and each paper is listened to with much interest. Noted specialists find in this Society very appreciative hearers and much pleasure in reading papers before them. The Princess Anne Hotel management made the visit of the Society very pleasant in every possible way, and the Old Dominion Steamship Company from New York made it very pleasant for the visitors from the North. The Virginia Society has found it practicable to hold their annual meetings at some watering-place in the mountains or by the seashore during the hot season; and this example could be followed with advantage by other societies. This would give greater attractiveness to the meetings and bring out larger numbers of the profession.

NECROLOGY.

WILLIAM LINDSLEY MUSSEY, M.D., Miami Medical College, Cincinnati, O., 1887, died in France, September 8. He was a son of the late Dr. William H. Mussey, and grandson of the late Dr. Harvey Lindsley of Washington, D. C. He was identified with the Women's Medical College of Cincinnati, as Demonstrator of Anatomy and Professor of Dermatology and Syphilography. He was also an Assistant-Surgeon of the Children's Hospital of Cincinnati.

CHARLES CARTER, M.D. of Blowing Rock, Watauga County, N. C., September 9. He was graduated from the College of Physicians and Surgeons in 1861, and in October of that year became an Assistant-Surgeon, U. S. Navy. Having served as such until February, 1863, he was appointed, after an interval of a few months, Surgeon of the U. S. Hospital, Turner's Lane, Philadelphia.

EUGENE S. FORMAN, M.D., University of Buffalo, N. Y., 1870, died from apoplexy, September 13, at his home in Auburn, N. Y.

JOSEPH F. KUHN, M.D., Long Island College Hospital, 1887, died at his home in Brooklyn, N. Y., September 12, aged 34 years. He was the son of Dr. Louis DeB. Kuhn.

GEORGE S. HANNA, M.D. of Hedgesville, Md., September 8, aged 70.——Abbie G. Hall, M.D. of Champaign, Ill., September 11.——Louis Hess, M.D. of Brooklyn, N. Y., September 11.——J. E. H. Nichols, M.D. of New York, September 10.——A. A. Sylvester, M.D. of Columbia, Ga., September 11, aged 64.——E. Steifel, M.D. of Gallion, O., September 3.——H. Scarboro, M.D. of Ellaville, Ga., September 8, aged 86.——Joseph O. Wilcox, M.D. of Dresden, N. C. September 8.——Stephen D. Ayers, M.D. of Marion, Ind., September 15. He was born at Morristown, N. J. in 1811.——Francis Huebler, M.D. of Elysburg, Wis., September 9.

MISCELLANY.

Personal.—Prof. Nicholas Senn has resigned his position of Lieut Col. U. S. V., to resume his practice in Chicago.

R. Stansbury Sutton, Major U. S. Vols., has resigned, and resumed practice in Pitsburgh.

A. C. Corr, M.D., of Carlinville, Ill., has been elected president of the Illinois State Board of Health, vice A. Adelsberger resigned.

Congenital Lacerations.—Congenital lacerations in the cervix uteri have been observed by Heil in three cases of nulliparæ, showing that the usual assumption that they are invariably caused by previous child bearing is not correct.—*Cbl. f. Gyn.* 1898, 19.

Civil Service Change.—The Medical Examining Board of the Chicago Civil Service Commission has been abolished by the Commission on the ground of economy. The retiring examiners deserve the thanks of the community for the able and efficient manner in which they have performed their duty, but

there is no valid reason why the City Health Department should not be utilized in this capacity.

Diagnostic Value of the Reflexes in Lesions of the Cervical Portion of the Cord.—Mendelssohn of St. Petersburg, asserts that all normal reflexes pass through the superior portion of the spinal cord and the inferior portion of the medulla oblongata. This theory explains the abolition of the reflexes with lesions of the cervical portion of the cord, as the lesion is an obstacle to their passage.—*Bull de l'Acad. de Méd.*, May 10.

The Tibia Substituted by the Fibula.—Three years ago Poirier resected the whole of the shaft of the tibia on a boy for osteomyelitis, replacing it in two steps by grafting the body of the fibula on the two tibial epiphyses. Radiographs now show that the graft has finely replaced the missing tibia. It has grown from 4 to 20 millimeters in diameter and also increased in length, answering its purpose so well that the lad recently won the first prize for gymnastics at his school. Another demonstration of the fact that the "function creates the organ."—*Semaine Méd.*, May 25.

To Improve Medical Certification in France.—Last year there were published reports from the civil tribunal of the Seine to the effect that the judgment of the court had been that all medical certificates must be written from the personal knowledge and not from hearsay information of the physician making the report. This year the court has rendered a judgment in a case which makes it a misdemeanor for a physician to certify to a lesion which would incapacitate the injured person from any labor for a considerable length of time, when in reality the injury was slight. And if, in consequence of such a false certificate, an insurance company has paid an indemnity to the third person, the physician is liable for damages if sued by the company.—*N. Y. Med. Jour.*

A Long-Lived English Family.—Dr. C. J. B. Williams of London, in proposing the health of Mr. H. Perigal, the treasurer of the Royal Meteorological Society, who was entertained at dinner on attaining his 92d birthday, gave some interesting particulars of the longevity of the Perigal family. It appears they have been remarkable for longevity. Mr. Perigal's father, who was 99¼ years of age when he died, was one of thirteen children, nine of whom attained respectively their 64th, 67th, 77th, 80th, 88th, 90th, 94th, 97th, and 100th year, the last five averaging 93 years and 100 hundred days. A brother of the treasurer, Mr. Frederick Perigal, now in his 85th year, was present at the dinner.

Removal of Fibroma of Base of Skull.—In order to open up the field of operation more completely, other methods having failed to accomplish the entire extirpation of the neoplasm, Max Jordan has operated two cases by lifting a tongue-shaped flap, which included the entire nose and cheek nearly to the ear, resecting the upper jaw-bone. In one case he opened the flap down to the center, turning each half back; in the other, he avoided the central incision and turned the whole flap back from the ear. In threatening cases and recurring growths, he advises this method in spite of the resulting scar, which shows only on the cheek, and is not very disfiguring, as can be seen from the cuts accompanying this article in the *Münch. Med. Woch.* of May 24.

Tinea Tonsurans in an Adult.—Tinea tonsurans in an adult is an event of great rarity. At a recent meeting of the Dermatological Society of London, Dr. Aldersmith presented a man, aged 23 years, who had contracted the disease from a hair brush used by a younger brother who had ringworm. There was only one patch and the majority of the hairs grew healthily and firmly, but scattered here and there were numerous black dots and very short stumps, some of which were in the form of little corkscrews. The skin of the patch was smooth. Such a case would probably have been overlooked without a careful examination with a lens. The stumps were so fragile that one could not be extracted entire. They were saturated with a large spore form of fungus—trichophyton megalosporon endothrix. The modified manner in which the fungus grew in this case as compared with the tinea tonsurans of children is interesting, the unfavorable nature of the soil being evident.—London *Lancet.*

Lupus Treated with the Roentgen Ray and Hot Air.—E. Schiff reports two children with lupus completely cured to date by the application of the Roentgen ray, and Lang has also had similar success with the Holländer apparatus, a coiled metal tube connected with a Bunsen burner, from which a stream of hot air at a temperature of 228 degrees C. at a meter's distance was directed upon the patches. The scab and blisters formed were only superficial, and the resulting cicatrization proved much smoother and more esthetic than after any other process.—*Munch. Med. Woch.*

Sanitary Precautions Against Phosphorus Poisoning.—It appears that the use of white phosphorus in match making is not interdicted in England, as it is in France and elsewhere. An inquiry in the House of Commons on this subject led the Home Secretary to make a statement that speaks most favorably for the results which have followed sanitation in respect to the match industry. He stated that the use of white phosphorus had been found less open to objection than has been asserted; on the contrary the information in his possession is that in some important countries, such as Germany, Austria and Belgium, its use is not prohibited. In England the use of white phosphorus is regulated by special rules, which have been so far successful that last year only two cases of phosphorus poisoning occurred, neither of which was fatal. In these circumstances he did not think there is sufficient cause for further legislative action.—*Medical News.*

Tetanus Cured with Intracerebral Injections of Antitoxin: First Application to Man.—The failures of antitoxin in curing tetanus are ascribed by Roux to the fact that the nerve-cells have more affinity for the toxin than for the antitoxin, and they therefore take it up from the blood, leaving the latter to circulate ineffectually, unable to reach and neutralize the toxin then accumulated in the nerve-cells. The conclusion follows that the antitoxin must be introduced directly into the nerve-cells to cure or prevent their intoxication, and this has been accomplished experimentally, arresting the disease at once and holding it stationary until convalescence commences. A case of severe and progressive traumatic tetanus in a boy of 16 years, has thus been treated at the fifth day, pulse 120 to 130. The skull was trephined on each side with an 8 mm. fraise, the dura mater incised and the needle inserted 5 or 6 centimeters at the base of the second frontal, far enough to avoid injury to the psychomotor centers, while still near enough to suffuse them with the antitoxin. The tolerance of the intracerebral tissues was perfect, confirming the experimental work on rabbits and guinea-pigs. The disease was definitely arrested, although there was some subdelirium, insomnia, tachycardia and oliguria, probably due to the severity of the established infection. Convalescence commenced the seventh day after the operation; complete nine days later.—*Presse Méd.*, June 18.

The Danger of Contagion from Typhoid Fever in Hospitals.—At a recent meeting of the Société Médicale des Hôpitaux, of Paris, Dr. Troisier stated that he had observed a case of typhoid fever in a young girl who was suffering from pleurisy, and that she had been surrounded by typhoid fever patients. He stated, also, that the patient in question had taken nothing but a tisane, milk and Dhuys water. Dr. Netter recalled having observed in the Trousseau Hospital twenty-seven similar cases, twelve of which had been among the attendants of the service. Dr. Gaillard had observed a case of typhoid fever, which the patient had contracted while in the hospital. Dr. Richardière

had seen a similar case of contagion in a patient suffering from myelosyringosis. In this case the pulmonary symptoms had predominated, and this had led him to the supposition that the contagion had been introduced by the respiratory tract.—*N. Y. Medical Journal.*

Medical Responsibility.—Two cases have recently been tried abroad which have attracted much attention. Professor Seidel of Brunswick was accused by his assistants of neglect of the ordinary precautions in operating, causing the death of a patient by infection from an unhealed furuncle on his finger. The authorities informed him that an investigation would be made, which so distressed him that he committed suicide. His brothers then brought suit against the assistants to restore their brother's reputation. Bergmann cited on the stand the varying opinions in regard to gloves as an instance of the diversity of opinions that prevail in regard to asepsis; some considering gloves a progress, others a direct menace to the patient. The Seidel brothers gained their case. The other case was tried in France. A woman was arrested suspected of infanticide, and Dr. Méloche, who examined her twice, stated that there were probable evidences of a recent delivery, but a few days later the woman was delivered in prison of a living child. Released at once, she sued the physician for 1000 francs damages, which were awarded her, the court adding to the peculiar features of the case by censuring him for not having examined the woman's blood. A higher court has recently exonerated Dr. Méloche and condemned the woman to the costs.

The Maragliano Treatment of Tuberculosis.—At Rome there has been opened an institute for the gratuitous supply of this serum to the poor. Its chief promotor is Dr. Passarini, who, on a tour of the Italian centers of population, where tuberculosis is most frequent, had his own convictions as to the efficacy of the serum confirmed by leading practitioners in those centers, and accordingly found the time ripe for such a dispensary in Rome as would place the prophylactic and curative virtues of the preparation within the reach of the humblest. He, with a staff of assistants, will undertake the consulting practice of the Institute and be responsible for the diagnosis of the cases in which the serum is specially indicated, while Dr. Maragliano volunteers the gratuitous supply of the serum in whatever quantities it may be called for. The initiative thus taken is a noble one, and at the inaugural proceedings the large attendance of leading consultants, teachers and practitioners, attested the due appreciation of it on the part of the profession. Its extension to other Italian cities can hardly fail to follow, and with the experience thus to be obtained, Dr. Maragliano anticipates a still further advance on the lines he has worthily laid. Nowhere more than among his compatriots has he found severer critics, but the rise of the new dispensary may be taken as significant that opposition has passed its acute stage, and that, to use Baccelli's words, the Maragliano serum has at length vindicated "its right to citizenship" in the medical commonwealth.

Alcoholic Somnambulism.—Dr. Francotte of Liége has published a carefully prepared paper, having special reference to the medico-legal relations of the somnambulism which is met with as a result of alcoholism. Somnambulism, regarded as the condition in which during loss of consciousness co-ordinated actions are carried out, of which there is no recollection afterward, is met with not only in hysteria, epilepsy, and the hypnotic state, but also as a result of alcoholic indulgence. The author relates the following case of a man who was arrested for disorderly conduct in a public place. He could not be induced to answer questions or even to speak, and appeared to be quite demented. There was no sign of intoxication, but next morning at the medical examination, he confessed that at a place far distant from that at which he had been arrested, he had imbibed a large quantity of alcohol. He had completely lost recollection of what had occurred during the next forty-eight hours. He confessed to other excesses in alcohol, and there was marked tremor of the hands and of the tongue. A sister had been the subject of mental disease. The author, after citing several examples, concludes that there is a species of alcoholic somnambulism in which the patient behaves to all appearance in a normal way, but without consciousness, or at least without having any recollection of what he has done. In reality, however, during such a time, certain slight peculiarities of conduct are present which may easily escape the observer. The condition manifests itself only in degenerate individuals, or at least in those who have inherited some psychic weakness, and as it is one which implies the absence of responsibility, unless it is intentionally induced, it is of great medico-legal importance.—*Neurologisches Centralblatt.*

Benefactions made by Women.—It is not often that two so large bequests by women come to the knowledge of the public at about one and the same time as are those lately made by two women of New York State. Two colleges and a hospital benefited by the wills of two women who have recently died. Mrs. Annie S. Paton of the borough of Manhattan, has bequeathed $100,000 to the Princeton University and $50,000 to the Manhattan Eye and Ear Hospital, and Dr. Elizabeth Bates of Port Chester, has left $125,000 for the endowment of a chair in the medical department of the University of Michigan, for instruction of the diseases of women and children. In addition to her direct bequests, Mrs. Paton has left $100,000 more to Princeton and $50,000 more to the hospital contingent on the death of her children, who have a life interest in the sums named. Dr. Bates was a graduate in 1853 from the then young and struggling Philadelphia College for Women; at the time prior to her decease, Dr. Bates was one of the school's senior surviving ex-students and alumnæ. These gifts bespeak our attention to the generosity of women to charitable objects, and to education; although it is no doubt true that the major part of the benefactions to colleges and hospitals have come from men, this fact is readily explained by that other fact that the property is held in the name of the legal head of the family. If the truth were known it would be found that many gifts have been suggested by the wife, and that frequently both husband and wife have united in planning for the benefit of the object of their mutual generosity.

Hospitals.

THE management of the South Barnabas Hospital of Minneapolis, Minn., has issued a circular soliciting donations to be applied to the hospital debt of $25,000. The authorities are making strong efforts to raise this amount on account of the availability of $50,000, left by the late Richard Martin, depending upon the liquidation of the debt.

THE Ensworth Hospital, St. Louis, Mo., has been purchased by the Methodist Episcopal Church, which will take charge of the institution October 1.

AT a recent meeting of the directors of the Mount Zion Hospital Association, San Francisco, Cal., it was decided to commence the erection of a new hospital, with accommodations for fifty patients, to cost about $40,000. This institution is a charity hospital, supported by Jewish subscriptions.

THE formal opening of the St. Margaret Memorial Hospital, Lawrenceville, Pa., has been postponed from October 1 to November 15.

THE Employers' Hospital Association of East St. Louis, has been incorporated with capital of $100,000.

THE Dunning (Ill.) Hospital for Consumptives will be formally opened October 8. Arrangements are being made for the entertainment of those attending the inspection of the institution.

THE report of St. Luke's Hospital, Jacksonville, Fla., shows

that 112 patients were treated in that institution during the month of August.

Bids for the Crozier Home for Inebriates, to be erected in Chester, Pa., have been opened. The contract was awarded for $47,480.

Detroit.

Wayne County Medical Society.—At the regular meeting of this society, held September 15, Dr. E. K. Bacon read a paper on the subject of "The Anatomy and Physiology of the Sympathetic Nervous System and its Bearing on Pelvic, Abdominal and Mental Trouble." The Doctor gave an elaborate and exhaustive description of the anatomy of the sympathetic nervous system and traced its bewildering intricacies throughout the entire body, showing how organs remote are connected by nerve branches, and making intelligible the phenomena of associated clinical symptoms in parts of the body widely separated and apparently unconnected. He enumerated a series of cases, occurring in his own practice, of reflex and sympathetic nervous irritation and explained clearly how, for example, dyspeptic symptoms are often caused from merely pelvic lesions, or how mental symptoms may be dependent upon abdominal pathologic conditions.

The society discussed the advisability of amalgamating with the Detroit Medical and Library Association. This society and the Wayne County Society are the two leading medical societies in the city, and many of the members of both societies have long desired a union of the two, but many difficulties have stood in the way, the chief one being in the choice of a name. After some discussion the question was tabled.

Dr. A. H. Steinbrecher reported nineteen cases of fever among returned soldiers he was treating at Harper Hospital. He stated that while many of the cases resemble typhoid fever, yet they are all undoubted cases of malarial fever. Widal's serum test has failed in every case, while in nearly all the plasmodium has been found in the blood.

Health Report for the week ending September 17: Deaths 75—under 5 years 37; births 72—male 31, female 41; contagious diseases, diphtheria 7, scarlet fever 10; deaths, from diphtheria 3, scarlet fever 6. One pair of twins born. One case of smallpox.

Louisville.

Kentucky School of Medicine.—The injunction granted Drs. Kelley and Woody in the local courts, enjoining Dr. Wathen from claiming to be Dean of the Kentucky School of Medicine, has just been made permanent by action of the Court of Appeals, it having been argued before that court and so decided.

Surgical Society.—The Surgical Society held its regular monthly meeting on the 5th inst., as guest of Dr. Jas. S. Chenoweth. A number of interesting reports of cases were made, and pathologic specimens exhibited. Dr. Chenoweth read a paper upon "Drainage of Cavities," and exhibited an ingenious apparatus for continuous drainage, specially applicable in gall bladder surgery. A number of different appliances were shown for other uses of this apparatus, the most practical of which, perhaps, was that to be used in lavage of the stomach.

MacCammon.—Dr. Vernon MacCammon has recently been appointed acting assistant-surgeon in the United States Army, and been ordered to Fernandina, Fla. He is a yellow fever immune, and has traveled extensively in the tropics. He is a recent graduate of the Kentucky School of Medicine.

Louisville Society of Physicians and Surgeons.—This society was entertained on the 8th inst. by Dr. Eugene C. Roemele. He read a paper entitled "Milk Infection."

Fowler.—Dr. and Mrs. J. W. Fowler celebrated their silver wedding most pleasantly on the 10th inst. Dr. Fowler is president of the Kentucky State Board of Pharmacy, president of the Louisville College of Pharmacy, and member of the State Pharmacy Examining Board. About two hundred guests were present on this most delightful occasion, and received invitations from Dr. Fowler to his golden wedding, twenty-five years hence.

San Francisco.

San Francisco County Medical Society.—Dr. McCone presented a case of syphilis of the peritoneum, at the regular meeting of this Society for the month of September. The history of the case was about as follows: A woman presented herself at the University of California clinic, some time in May, saying that the trouble for which she sought relief had existed for the past eleven months, steadily growing more aggravated. She was a prostitute, 29 years old, had two children, no miscarriages, and had been previously regular in her menstrual law. She acknowledged to the initial sore of syphilis, four years previously acquired, but said that she had had no trouble that could be, in her opinion, due to that cause. On examination, the abdomen was found to be very much enlarged, with the umbilicus protruding; the genitalia presented a very curious condition. There was a diverticulum connecting the vagina with the rectum; the anterior wall of the vagina and the bladder were drawn upward; all the parts in the neighborhood were very much injected and edematous. A sound was introduced into the uterus and easily passed to a distance of five inches. The mass in the abdomen exerted a mechanical pressure upon the lungs and heart which had very much interfered with respiration and the circulation. She was sent to the City and County Hospital, where a consultation was held between Drs. McCone, Kerr and von Hoffman; no diagnosis was made at this time, but it was decided to operate and see what the condition in the abdomen could be. Dr. von Hoffman operated, with the assistance of Dr. McCone. When the abdominal wall was cut through, there escaped 2½ gallons of a dark brown, coffee-colored, apparently non-purulent fluid. The intestines were found somewhat matted together, and the whole abdominal viscera covered with a thin, delicate membrane. A large number of nodules were observed in different parts of the abdomen. Nothing at all characteristic of any known disease could be found, and the diagnosis was not made even at this time. The patient did not recover from the operation, but rapidly sank and in a few hours died. Postmortem examination showed a very great number of nodular enlargements in the abdomen, scattered promiscuously about, but nothing at all definite. The nodules were red and were not broken down; some of them exhibited a very clear picture of granulation tissue; one was noted about the size of a man's fist, solid and not at all broken down. Specimens were taken which were subsequently cut and examined microscopically, but with no new light being thrown upon the disease. It was stated by one examiner of the specimens, that the disease might have been syphilis. A more careful examination of the body, after death, resulted in the discovery of some of the typic syphilitic scars, with round, punctured edges and thin skin, on the inner side of both thighs. A careful search of the published literature which might possibly have any bearing on the case was made, with the result that it was found to almost parallel the case reported by Lancereau in his work. The similarity between the two cases being so great, it was assumed that the diagnosis of the case under discussion was, in all probability, syphilis of the peritoneum. In reply to a question Dr. McCone stated that the patient had had no abnormal temperature while she had been under observation, either before or after operation. The pathology of the case was discussed by Dr. Douglas Montgomery and by Philip King Brown, the latter holding opinion that while the disease might have been caused by, and might have been indeed syphilis of the peritoneum, there was absolutely nothing in the report of the case that would make such a diagnosis unquestionable. He was also of the opinion that it would be absolutely impossible to

make a diagnosis from the microscopic appearance of the specimens which had been removed, as they showed nothing except that there were nodules, in the abdomen, of granulation tissue, and that these were not broken down, as one would expect to be the case in tubercular peritonitis. The presence of the sero-purulent membrane rather contraindicated syphilis as the causative factor.

Dr. F. Dudley Tait agreed with Dr. Brown in his opinion that the diagnosis of syphilitic disease of the peritoneum had not been shown in the case reported, and the condition may have been something quite different. He was also of the opinion that it would be absolutely impossible to diagnose syphilis by means of the microscope. The case may have been one of tubercular infection, or infectious inflammation from some other cause; it might also have been due to syphilis, but this was far from having been proved to be the case. Dr. McNutt exhibited the kidneys of a man of about sixty who had been killed by a passing car, while jumping from the cable car on which he had been a passenger. There had been no history of any disease of the kidneys and the man was considered to have been in perfect health up to the time of his death. On postmortem examination the kidneys were found to measure 9 x 4 x 6 inches, and to weigh three pounds each; they were one mass of multilocular cysts, hardly any trace of true kidney tissue being discernable. He read extracts from the most recent writers on the subject, the majority of whom were of the opinion that cystic disease of the kidney, of this variety, was a congenital affection which had persisted into adult years and was seldom the cause of death. The specimens were exhibited and were particularly fine. On motion of Dr. Philip Mills Jones, the sum of $500 was voted for additions to the library.

APROPOS of the discipline of the Tennessee regiment, a recent visitor to the Presidio, where the regiment is encamped, witnessed a number of the men tossing one of their officers in a blanket. On inquiry it was discovered that the officer in question had done something to displease the men and they were simply adjusting the punishment to fit the crime.

Two of the positions left vacant by the death of Dr. J. F. Morse, have been filled. Dr. L. Bozet has been appointed to the Board of Health, and Dr. Fehlaisen has received the appointment as chief surgeon to the German Hospital.

THE PUBLIC SERVICE.

Movements of Army Medical Officers.—To duty with troops at Camp Wikoff, Montauk Point, L. I.: Major Charles Adams, brigade surgeon, from Camp George H. Thomas, Ga.; Major Royce D. Fry, brigade surgeon, from the general hospital, Ft. McPherson, Ga.; Major Eugene L. Swift, brigade surgeon, from camp at Lithia Springs, Ga.; Majors Henry I. Raymond and Adrian S. Polhemus, brigade surgeons, from the 3d Corps at Chickamauga Park, Ga.; Major Chas. M. Gandy, brigade surgeon, from Tampa, Fla., and the following Acting Asst-Surgeons: Herbert I. Harris from Buffalo, N. Y., Edward M. Parker from Washington, D. C., Thomas H. Lowe from Baltimore, Md., Raphael A. Edmonston from Washington, D. C., Delos L. Parker from Detroit, Mich., James McV. Mackall from New Haven, Conn., Elijah J. Russell from Baltimore, Md., Charles A. Hamilton and Wm. O. Cutliffe from Washington, D. C., Orrin S. Mills from Gallipolis, Ohio, Frederick W. R. Lapsley from Chicago, Ill., John A. Tanner and Henry B. Lee from New York City, George Dock from Ann Arbor, Mich., W. T. Hamilton and Stephen M. Long from Washington, D. C., Charles H. Fischer from Detroit, Mich., and James S. Kennedy from sick leave at Chambersburg, Pa.

To duty with troops at Camp Meade, Pa.: Major Frank Bruso, brigade surgeon, from the 3d Corps at Chickamauga Park, and acting Asst.-Surgeon Donald Maclean from Detroit, Mich.

To duty with troops at Lexington, Ky.: Acting asst.-Surgeons Matthew Leepere from Milan, Mo., Henry J. Hinkel from Baltimore, Md., Philip P. Parrish from Afton, Va., William J. Boyd from Pavilion, N. Y., and James B. Stewart from Bradford, Pa.

To duty with troops in Chickamauga Park, Ga.: Acting Asst.-Surgeons Howard Carey from Sand Beach, Mich., Erwin I. Shores from Bridgewater, Mass., William T. Tanner from Buffalo, N. Y., F. Arthur Zeller from St. Paris, Ohio, Charles S. Pinckney from Charleston, S. C., Alfred O. Stimpson from Thompson, Pa., and Josiah B. Trudgian from Washington, D. C.

To the Sternberg hospital in Chickamauga Park, Ga.: First Lieut. Jesse Roux, Asst.-Surgeon 1st Illinois Cavalry, and acting Asst.-Surgeon George Dock from duty at Montauk Point, L. I.

To duty with troops at Camp Poland, Knoxville, Tenn.: Acting Asst.-Surgeons Thomas W. Jackson from Philadelphia, Pa., and Thomas H. Kearney from Washington, D. C.

To duty with the 7th Army Corps at Jacksonville, Fla.: Major Peter D. MacNaughton, brigade surgeon, from duty at Montauk Point; Major A. H. Appel, Surgeon U. S. A., from Fernandina, Fla.; Majors Geo. A. Smith, Bial T. Bradbury and Milo B. Ward, brigade surgeons, from duty with the 3d Corps at Chickamauga, Ga.; Majors Simon P. Kramer and John G. Davis, brigade surgeons, from duty at Camp Wikoff, and the following acting Asst.-Surgeons: H. A. Eberle from Canton, Ohio, George A. Thompson from Phenix, Ind., Samuel S. Rodman from Frankfort, Ky., Donald P. McCord from St. Louis, Mo., Eugene W. Davis from Saginaw, Mich., John Gilbert from Philadelphia, Pa., Murray F. Mudge from Gaines, N. Y., Daniel C. Cooney from Washington, D. C., Thomas W. Bath from Normal, Ill., Melchor G. Cockey from Belvue, Kan., Raphael Echeverria from Washington, D. C., and Charles V. Buttler, Charles G. Eicher, Francis R. Percival, Frank W. Ross and John T. H. Slayter from duty at Camp Alger, Va.

To duty with troops at Huntsville, Ala.: Acting Asst.-Surgeon P. S. Field from Baltimore, Md.

To duty at the general hospital, Ft. McPherson, Ga.: Lieut. Marshall M. Cloud, Asst.-Surgeon U. S. A., from sick leave at Atlanta, Ga.

To the charge of sick in hospitals of Philadelphia, Pa.: Major David C. Peyton, brigade surgeon, from Camp Meade, Pa.

To duty at the Josiah Simpson hospital, Ft. Monroe, Va.: Major James M. Jenne, chief surgeon of volunteers, from the 3d Corps at Chickamauga Park, Ga.; First Lieut. Leigh A. Fuller, Asst.-Surgeon U. S. A., from New York City, and the following acting Asst.-Surgeons: F. A. Hudson, Lewis M. Walker and B. F. Wooding from Denver, Colo.; Ernest W. Ewell from Lancaster, N. Y., George A. Curriden from Chambersburg, Pa., Walter S. Chapman from San Carlos, Ariz., Frederick W. Fabricius from New York City, and John R. Devereux from duty at the Leiter hospital, Chickamauga Park, Ga.

To duty with the U. S. Commission on the evacuation of Cuba: Acting Asst.-Surgeon W. T. Lainé, from duty at Camp Wikoff.

To duty at Santiago, Cuba, via New York City: Acting Asst.-Surgeons J. D. Dabney from Birmingham, Ala. J. M. Eindsley from Camp Wikoff, L. L., and L. B. Bluitt from Quincy, Ill.

To duty at Ponce, Porto Rico: Major W. C. Gorgas, Surgeon U. S. A. from Santiago, Cuba, and the following acting Asst.-Surgeons: John W. Thomas from Camp Wikoff, L. I., E. Harold Williams from Hamilton, Ga., William R. S. George from Houston, Texas, and Ferdinand H. Schoelle and Martin M. Dolan from Baltimore, Md.

Honorably discharged: Thos. C. Kimball and Edward Boeckmann, chief surgeons of volunteers; Majors R. Stansbury Sutton and Geo. T. Vaughan, brigade surgeons, and Major Andrew P. Biddle, Surgeon 31st Michigan Infantry.

Resigned: Major Sprague Winchester, Surgeon 5th U. S. Vol. Infantry; Major Geo. G. Ward, Jr., Surgeon 12th New York Inf.; Major Henry Wallace, Surgeon 47th New York Inf.; Lieut. Jos. B. Whiting, Jr., Asst.-Surgeon 1st Wisconsin Inf., Lieut. J. B. L'Hommedieu, Asst.-Surgeon 9th New York Inf., and Lieut. F. R. Newberry, Asst.-Surgeon 5th Missouri Inf.

CHANGE OF ADDRESS.

Bell, H. A., from Butler, Pa., to Phoenix, Ariz.
Boardmaster, S. A., from Lake Geneva to Janesville, Wis.
Carroll, T. W., from Galveston to St. Paul's Sanitarium, Dallas, Texas.
Campbell, F. F., from Fairfax to Blunt, S. D.
Chapman, W. S., from San Carlos, Ariz. Ter., to Ft. Monroe, Va.
Clough, J. A., from Spring Valley to 306 S. Barstow, Eau Claire, Wis.
Dicken, H. W., from Petoskey to Cross Village, Mich.
Drayton, H. S., from 27 E. 21st Street to 12 E. 17th Street, New York, N.Y.
Drake, G. W., from Monteagle, Tenn., to Hallms, Va.
Follansbee, E. A., from 533 S. Broadway to Laughlin Building, Los Angeles, Cal.
Gray, A., from 456 Ogden Avenue to 125 Flournoy, Chicago, Ill.
Jenkins, M. J., from Indianapolis to Valley Mills, Ind.
Kaszynski, J., from 151 W. Blackhawk to 700 Milwaukee Ave., Chicago.
LeCount, E. R., from 1413 W. Madison Street to 120 Warren Avenue, Chicago, Ill.
Luster, J. C., from St. James to Rolla, Mo.
McDougall, G. T., from Osseo to 583 11th Street, Milwaukee, Wis.
McMahon, D. B., from Omaha to Newman Grove, Neb.
Moir, C., from 204 Shipp Avenue to 2403 3d Street, Louisville, Ky.
Peavey, J. L., from Denver to Colorado Springs, Colo.
Roop, J. W., from Portland to Montrose, Ark.
Shoemaker, S. A., from Eureka Springs, Ark., to Reiffsburg, Ind.
Sutton, R. Stansbury, from duty with army to 170 Ridge Street, Pittsburg, Pa.
Wedding, S. J., from Sulphur Springs to Hartford, Ky.

LETTERS RECEIVED.

Adams, C. B., Vanceburg, Ky.; Ard, F. C., Plainfield, N. J.; Atkinson, W. B., Philadelphia, Pa.
Bowen, D. R., Wellsburg, N. Y.; Bruner, William E., Cleveland, Ohio; Burnham, A. A., Chicago, Ill.
Callahan, J. R., Cincinnati, Ohio; Carveth, Florence, Port Hope, Ont.
Darling, C. G., Ann Arbor, Mich.; Derge & Co., A. R., Salt Lake City, Utah; Doerner, J., Buffalo, N. Y.
Egan, J. A., (2) Springfield, Ill.; Elgin Milkine Co., (2) Elgin, Ill.
Fischer, Louis, New York, N. Y.; Forum Publishing Co., New York.
Grigg, T. A., Butte, Mont.; Guthrie, E. C., Aspen, Colo.
Hughes, Don C., Findlay, Ohio; Hummel Adv. Agency, A. L., New York.
Johnson, F. S., Odebolt, Iowa; Jones, S. C., Crane Nest, Ky.
Kiernan, J. G., Chicago, Ill.; Kress & Owens, New York, N. Y.
Martin, Franklin J., Chicago, Ill.; Mathews, J. M., Louisville, Ky.; Montgomery, L. H., Chicago, Ill.; Morrison, W. T., Bay Port, Mich.; Moulton, H., Fort Smith, Ark.; McElfresh, C. H., St. Louis, Mo.; Mulford Company, H. K., Philadelphia, Pa.
Nelson, L., Hillsboro, Ohio.
Patterson, Jas, A., Salem, N. J.; Prioleau, W. H., Summerville, S. C.
Rand, F. T., New York, N. Y.; Reed, C. A. L., Cincinnati, Ohio; Rice, W. G., Muncie, Ind.; Robinson, Byron, Chicago, Ill.
Sampson, F. E., Creston, Iowa; Sanitarium, The, Battle Creek, Mich.; Savage, G. C., Nashville, Tenn.; Smith, E. J., Harlan, Iowa; Smith, J. E., Philadelphia, Pa.; Stafford, M., Ansten, W. Va.
Tasche, J. C., Franklin, Wis.
Watts, C. W., Moberly, Mo.; Weeks Drug and Chemical Co., Jackson Mich.; Wells, W. A., Washington, D. C.